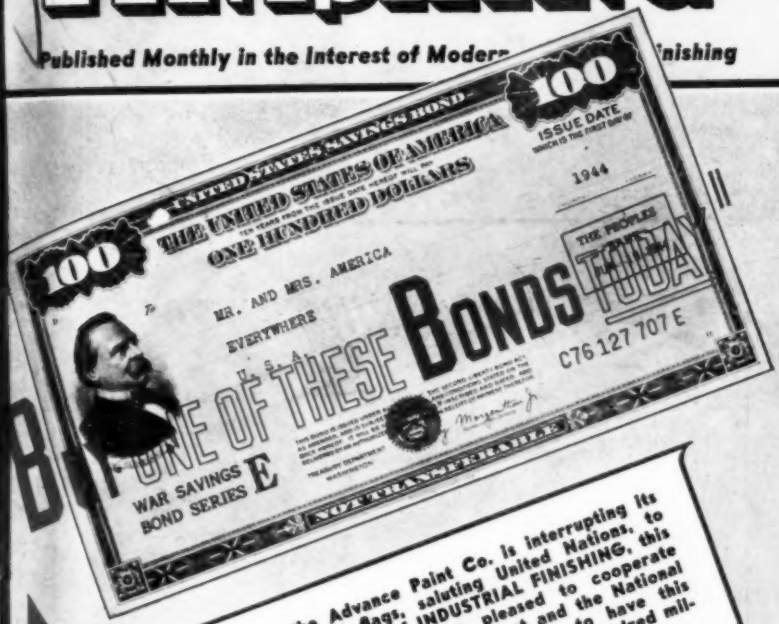
JUNE, 1944

Industrial FINISHING

Published Monthly in the Interest of Moder... ...nishing



This month the Advance Paint Co. is interrupting its regular series of flags, saluting United Nations, to bring to you readers of INDUSTRIAL FINISHING, this important message. We are pleased to cooperate with the U. S. Treasury Department and the National Publishers Association in their efforts to have this message appear on the front covers of a hundred million magazines between June 12 and July 1.

5th WAR LOAN DRIVE

ADVANCE PAINT COMPANY

INDIANAPOLIS, INDIANA

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—Switch to RINCONTROL

IF WARTIME wrinkle finishes aren't giving you proper service, it's your cue to investigate Rincontrol—a product that meets pre-war production standards. It bakes out hard in one hour at 275° F.

And we mean really *hard!* Hard enough right from the oven to permit stacking parts without flattening the texture—tough enough to resist assembly line abuse.

Maintaining the high standard of Rincontrol uniformity, resistance to corrosion and abrasion in the face of current raw material difficulties is another outstanding example of the ingenuity of Roxalin product engineers. Write for Rincontrol Bulletin No. 746 for technical information and specifications.

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INCORPORATED
ELIZABETH • NEW JERSEY

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Brings surface active forces into play to form a thin foam that traps acid fumes and spray. This prevents corrosion of surrounding equipment and protects the health of workers—safeguarding expensive installations and keeping labor happy. New literature tells eight additional advantages of using Enthone Acid Addition Agent.

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Plating Equipment and Chemicals
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THE SPOTLIGHT IS ON!

Specification finishes, as used in war production painting, have revealed the suppliers' ingenuity and capacity for meeting all emergencies. Thus, this experience and the knowledge gained through war demands upon the industry well prepares paint manufacturers for post war requirements.

WALKER FINISHES!

THE COMPLETE line of Walker modern production finishes includes primers, surfacers, lacquers, wrinkles, synthetics and special coatings for special purposes. These have all been developed and formulated after considerable research by Walker Laboratories, and bear the final stamp of approval placed upon them by hundreds of customers.

Walker has what you want, or will make it—the best of finishes for application on metal, wood, plastics or any other material that may be in use.

"Call on Walker"

H. V. WALKER CO.

Elizabeth, New Jersey

MODERN PRODUCTION FINISHES

TWENTIETH YEAR OF PUBLICATION

Industrial FINISHING

W. H. ROHR, Editor E. A. DOSCH, Assoc. Editor

Vol. XX, No. 8 JUNE, 1944 $2.00 a Year

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Eastern Representative: C. A. Larson, 254 West 31st St., New York 1, N. Y.; Phone Penna. 6-9049

Letters from Readers

Silk Screen Stencils

Referring to the articles, "Finishing Fiberboard Panels," on pages 68 and 70 of the May 1944 issue, where various methods of graining are discussed, we would appreciate the names of manufacturers who will be able to furnish screen stencils.—F. & T.

Information supplied.—ED.

Filter Wiping Machine

Would you please give us the name of one or more manufacturers of a power-driven filler-wiping machine?—V. R. Co.

We are sending you the name and address of a Chicago manufacturer of a "Power Filler Rubbing Machine" which is illustrated and described in an old 4-page folder we have in our files. It is a portable outfit with the rubbing wheel attached to a flexible shaft which, in turn, is driven by a ½-hp. electric motor. The rubbing wheel consists of short wide felt pads, radiating out from a central shaft that rotates at low speeds (100, 150 or 320-rpm.). At first glance it looks like a midget water wheel, 9-in. in diameter, with about 20 blades 5 or 6-in. wide. Whether or not it is available today, we do not know.—ED.

Glad I Saved I. F.

It has been several months since I have vied with others for a chance at your incoming mail basket, and in the interim I have designed, equipped and gotten into production one of the few successful drum-reclaiming plants in this area (Houston, Texas). And how the finishing problems have popped up and demanded immediate action! I've found I. F. very helpful, and have had many reasons for being thankful that I resisted the combined efforts of the waste-paper drives and my (home) boss who urged that I turn in the files of your magazine. . . .—ELTON STERRETT.

Spray Booth Coating

Please furnish us with the name and address of the manufacturer of a coating that is applied to spray booth walls, which can be later peeled off, thereby removing the accumulated waste spray.—W. C. Co.

Information furnished.—ED.

Dipping; Tumbling; Whirling

We would appreciate your sending us tear sheets of past articles in INDUSTRIAL FINISHING, in connection with dipping, tumbling and whirl finishing. B. W. Co. (Fine Metal Furniture and Novelties).

Roller Coating Machines

We will appreciate it if you would send us a list of manufacturers of roller coating machines suitable for coating 30x2-in. rectangular tubes.—M. U. Co. (Tables and Metal Specialties).

Metal Casket Handle Finish

We are figuring on casket handles, drawer pulls and other metal parts that require decorative finishes (such as gold dye, copper, brass and a very fine gold bronze) in the postwar era, and would like to have the name and address of a company handling this type of finish and bronze powders.

We are sending you a sample with the shade of gold and white finishes we require to carry on this work, and would appreciate whatever information you can supply us.—T. & D. Co.

Can Supply Dip Tanks

We note in recent issues of this magazine that you receive many inquiries for dipping machines and you estimate that perhaps this would be an opportunity for some concern. We are highly specialized in the manufacturing of all kinds of dipping machines and we even have a standard type fully described in a pamphlet (which we are sending you) with

TOUGH . . .
HARD . . .
MAR PROOF . . .

Flo-Bake

A HIGH SPEED baking synthetic . . . resistant to grease, oil, alkali, alcohol and mild acids . . . Widely used on hospital furniture, Signal Corps apparatus, galley equipment, control instruments, etc.

Bakes in ten minutes at 300 degrees to a hard protective coating with great adhesion.

Full information and samples on request.

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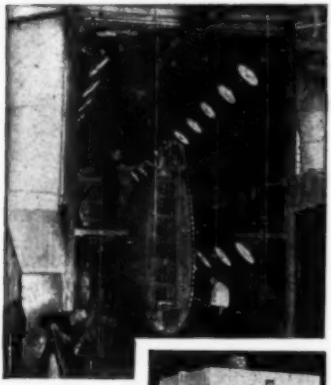

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prices ranging from $300 to $800 per unit, according to size and heating device requested. We will be very pleased to answer any questions from your readers.—Magnus Chemical Co., Inc., Garwood, N. J.

No "Penseal" but Something Else

In reply to the A. D. Co., who inquired about "Penseal" in the "Letters from Readers" column of April 1944 I. F., although we are not familiar with the product "Penseal" we manufacture several slushing oil-type rust-preventives that are applicable for the protection of aluminum against corrosion during storage.—Tretolite Co.

For Dipping Tips of Heavy Cotton Cord

With regard to B. A. Co.'s request for a suitable dipping solution to prevent the unraveling of a cotton cord, as set forth on page 6 of your April issue, we are pleased to advise you that, providing B. A. Co. has the proper end use, so that raw materials may be obtained from the War Production Board, we have an excellent non-raveling solution.—Hermetite Corp.

Cigarette Proof Clear Finish

A few years ago, while visiting the Furniture Mart, my attention was called to a clear lacquer finish on card tables and hotel furniture which would stand up under cigarette and alcohol marks. Can you advise me the name and source of this material, so that a sample quantity can be ordered for try-out purposes?—V. A.

Several firms now make or formerly made something that should take care of your requirements. We are sending you names of a few of them.—Ed.

That Carbon-Dioxide Fire Extinguishing System

We were very much interested to see the article in the April Issue of INDUSTRIAL FINISHING (pages 52-59) which described a built-in carbon-dioxide fire-extinguishing system installed in the Philadelphia Naval Storage Depot. Of special interest was the statement, "the largest built-in carbon-dioxide system in the world, from the point of view of cubic feet of space protected." While your story did not give dimensions of the building, a similar article in another publication stated that the building is 577-ft.x115-

New Items? YES...

PLENTY OF THEM!!!

Tell us your finishing problems and we will tell you about the new items we have developed to solve them.

V. J. DOLAN & COMPANY, INC.

Manufacturers "Unquestionable Quality"
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ft.8-in. by 16-ft.8-in. Very simple computation discloses that the total volume in cubic feet is 1,150,000. Therefore, the fire extinguishing system, while it may fairly be called large, is actually in no way unusual in point of size.

A brief review of representative engineering data on installed Cardox Fire Extinguishing Systems (using low-pressure carbon dioxide) shows that in the case of a West Coast Naval Air Base, one building totaling 1,605,400-cu.ft. is being protected by a single total flooding system. This building has been divided into six hazards, three of which each comprise 337,800-cu.ft. In the article describing the system protecting the Philadelphia Naval Storage Depot, it was said that the largest hazard required a discharge of the entire bank of 280 50-lb. cylinders. Assuming that minimum, N.F.P.A. standards have been met, wherein 4½-lbs. of CO_2 is to be provided for each 100-cu.ft. of space to be protected, the largest single hazard is indicated as comprising 320,000-cu.ft. Thus, not only is the building in Philadelphia much smaller in total cubic feet content, but the largest single hazard is also smaller than any of three in the case of the West Coast Naval Air Base.

One of the large hazards at a mid-west Army Air Force establishment, for which a Cardox Fire-Extinguishing System is providing protection by total flooding, has a content of 455,790-cu.ft. The significance of this lies, of course, in the fact that the size of a fire-extinguishing system can be more accurately determined on the basis of the magnitude of the largest single hazard, rather than on the basis of the total cubic content of the building so protected. However, by either standard, the figures as given here clearly show that Cardox Systems very much larger than the system described in your article have been engineered and installed. As a matter of fact, there are numerous instances in which the volume of space protected by carbon dioxide flooding by means of a single Cardox System exceeds by a considerable margin the 1,150,000-cu.ft. protected by the system in the Philadelphia Naval Storage Depot.

Another denominator in the measurement of size of any CO_2 fire-extinguishing system is, of course, the amount of carbon dioxide which the system provides for extinguishment. On this basis, the system described in your article could not accurately be termed of greater than medium size. There are numerous Cardox Systems now installed in which carbon dioxide capacities of 20, 30 and even 40 tons are utilized. The 7-ton CO_2 capacity of the system installed at the Phila-

(Continued on page 104)

UNI-LAC

An "emergency" material that came to stay.

Better than the products it replaced.

UNI-LAC gives a hard, durable coating; quick-drying; easy to use.

Sands easily and cleanly.

Sets all stains perfectly. Works perfectly over filler.

Can be followed with lacquer or varnish (any type).

UNI-LAC is non-critical, but not unlimited.

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HIGH POINT, N. C.

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DIALING NEWS from the far corners of the earth right into your living room is a serious crime in Hitler's Germany. It might let people know what's going on—might poison German minds against their leaders. But here, no one tells you or your family what you can listen to on your radio, any more than they tell you what to read or say or what church to attend. That's your business. You're an American.

Protect your heritage as an American by buying one of the new 5th War Loan Bonds today. We here at the Lilly Varnish Company will buy our share . . . . . let's all buy our share (or more) and put this new 5th War Loan drive over the top.

LILLY VARNISH COMPANY
INDIANAPOLIS, IND.

Do you know...? Quiz on wartime

Q. Airplane bomber and glider noses are made of:

☐ Plexiglas ☐ Lucite ☐ Lumarith

A All three are used. In cementing reinforcing ribs in plastic domes, great care must be taken to keep cement off plastic section around the rib. Permacel paper masking tape serves to protect the dome perfectly—holds tight till the cement dries, then strips off clean, taking surplus cement with it.

Q. What's being dropped from these planes?

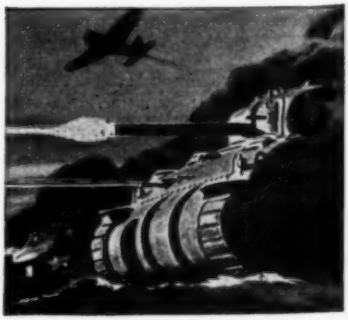
☐ Signal flares ☐ Parachute bombs ☐ General supplies

A. Parachute bombs. However, signal flares and general supplies are also dropped from planes. Containers for all three—as well as for shells, high explosives, and many other military items—are held together and sealed against dirt and damage with tough, quick-stripping Permacel cloth tape (Jonflex).

Q. When a tank goes into battle its gun muzzles are covered with:

☐ Gun boots ☐ Tape ☐ Nothing

A. Permacel moisture-proof cloth tape (Utilitape) is used to seal gun barrels against dirt and moisture. Also used to protect tanks and planes against corrosion during overseas shipment, this tough, moisture-proof tape will tomorrow protect overseas shipments of automobiles, farm implements and other peacetime products.

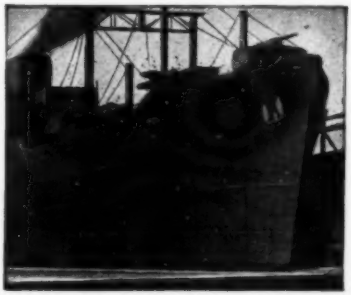


short-cuts useful for peacetime production—No. 3

Q This post-war package may be sealed with same tape now used to:

☐ Protect wing ribs ☐ Insulate wires
☐ Seal shell canisters

A. Permacel's companion cellophane tape, Texcel—now used for protecting wing ribs and for many other war jobs—will find many applications in post-war packaging. Shirt envelopes, candy boxes, suspender and garter containers are but a few of many items this quick-sticking, durable cellophane tape will seal better.



Q. Ships entering mine fields elude magnetic mines by:

☐ Careful navigation ☐ Speeding up
☐ Depolarizing the ship

A. Current passed through a special cable depolarizes the ship. A special Permacel cloth tape plays an important part in this operation. Created to meet a special need, this tape is an example of how The Industrial Tape Corporation meets the challenge of unusual and exacting specifications.

Q. Which of these types of pressure-sensitive tapes can help speed and improve *your* production?

☐ Paper ☐ Cloth ☐ Cellophane
☐ Metal ☐ Glass

A. All of these types of Permacel tapes are today used in war production. Many war uses will prove helpful in your business when you return to post-war work. Meantime, our research laboratory facilities are available to you for development of special tapes to fit war or post-war needs.

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Industrial Tapes
INDUSTRIAL TAPE CORPORATION
New Brunswick, N. J.
Makers of Texcel Tape

Tests Show POLYMERIN FINISH is *NINE TIMES HARDER TO CHIP!*

An impartial testing laboratory, using enameled sections of frame tubing, has proved that Polymerin* is 9 times harder to chip than ordinary enamels. Polymerin-finished metal may be banged repeatedly... the metal itself becomes dented... but the Polymerin surface is not chipped, not scratched, *not even marred!*

Resistance to chipping and marring has made Polymerin an outstanding finish for products which must have lasting protection. In addition, Polymerin, which can be formulated from almost dead flat to a very high gloss—in clear and all colors—contributes generously to beauty and "eye appeal!"

Polymerin is the name used by Ault & Wiborg to identify a related group of organic industrial finishes with unusual properties of beauty and durability that may be varied to meet the requirements of specific applications. Polymerin—the original speed-bake finish—may be cured in infra-red or conventional type baking ovens. And leading users of infra-red have proved that Polymerin cures *faster* to a *harder*, more *flexible* film.

For your postwar products, investigate the resistance, appearance and production advantages of a Polymerin finish. These advantages are factually presented—with "case history" examples—in "The Facts on Polymerin." Send for your copy today! Ault & Wiborg Division of Interchemical Corporation, Dept. C-1, Empire State Building, New York 1, N.Y. *U.S. Pat. Off.

3 REASONS why POLYMERIN-finished Products have more sales appeal!

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2. BEAUTY! Formulated in clear, white and all colors, Polymerin contributes beauty and "eye appeal". Polymerin white will not fade nor yellow.

3. PRODUCTION ECONOMY! Polymerin's speed-bake advantages, with resultant savings, help the manufacturer to keep his costs and prices low.

★ BUY ★ MORE BONDS

CAN YOU GET POLYMERIN NOW?

Comparable to regular Polymerin in flow, flexibility, durability and lustre is Polymerin-200, a new non-critical finish that can be handled exactly the same as regular Polymerin! Polymerin-200 is made from materials which are currently obtainable. It is available now without restriction!

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A Product of Ault & Wiborg Division of Interchemical Corporation

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FINE FINISHES
The skill of expert craftsmen, the artistry of the designer, the beauty of the wood, the excellence of the product—all of these are enhanced thru Artesian Finishes. These fine finishes, developed to solve your finishing problems are another example of the knack and ingenuity of American-Marietta technicians and will give your products new, more interesting eye and sales appeal.
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To Speed Production—The Paasche Type CUB High-Production Airbrush provides the fastest method for spraying all types of finishing materials. Its light weight (only 22 ozs.), perfect balance and "hand molded" grip enable men or women operators to work longer hours at full production.

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To Slash Replacement Costs and Headaches—The sturdy construction—with all working parts enclosed in strong, machined brass body—protects against damage and assures longer life. Floating air valve takes up wear, prevents leaks. The CUB stays on the job!

These special advantages of the Paasche High Production Airbrush are typical of the superior quality features to be found in the entire Paasche line. Get the facts and you'll get Paasche Airpainting Equipment.

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Airbrushes, automatic and special airpainting equipment, airfinishing booths, pressure regulators, airconditioners for compressed air lines, air dusters and stripers.

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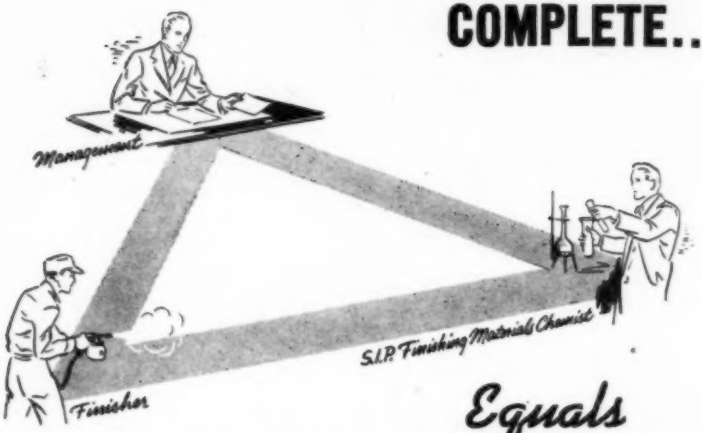

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To see that you, Mr. Finisher, get finishing materials exactly fitted to *your individual needs*, for your own particular work . . . and to make sure that S-I-P Finishes return *dividends* to Management in smooth-flowing *production at lowest cost*.

If you have a finishing problem that no ready-made "package" can take care of, call an S-I-P specialist! You'll find him a practical shirt-sleeve mechanic whose broad experience and technical knowledge can be genuinely helpful.

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High efficiency and speed for all types of painting and finishing jobs . . . . . .

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TYPE "BAC" AIR CONTROL UNIT

• The proven design and precision construction of the Kellogg-Crown "25" Spray Gun assure dependable, trouble-free operation—non-tiring, free-swinging balance—quick and easy adjustment from round to all widths of fan spray.

To eliminate oil and moisture from the air line, rely on this Kellogg-Crown Air Control Unit. Superior features assure constant pressure, clean, dry air and unusually large flow capacity.

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SYNCHROME ALUMINUM PAINT

You've waited patiently for CRES-LITE Ready Mixed SYNCHROME ALUMINUM PAINT. *Now* it is again available for an extensive list of uses, on orders carrying AA-5 or higher preference rating.

Write at once
for complete details of WPB permitted uses.

*For any of the uses permitted by WPB on AA-5 rating.

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. . to make her a skilled operator

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For wet or dry work, curved or flat surfaces, on wood, metal, plastics, slate, composition, and other materials.

The straight-line reciprocating action of the "EASY" mechanically duplicates the approved back-and-forth motion of hand block sanding. Fast, short stroke, floating sanding pad, and universal drive, prevents gouging, swirls, laps, or heating of the work.

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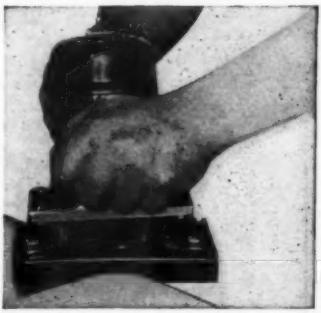

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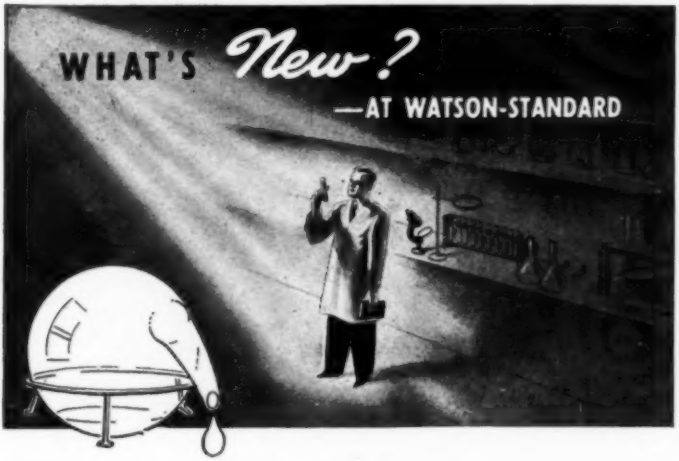

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A Standard for the Industry
Now available under war restrictions

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If you are designing a new product, no matter what the material may be, remember that Watson-Standard Laboratories have a special prescription finish for it.

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FINISHES AND LITHOGRAPH COATINGS

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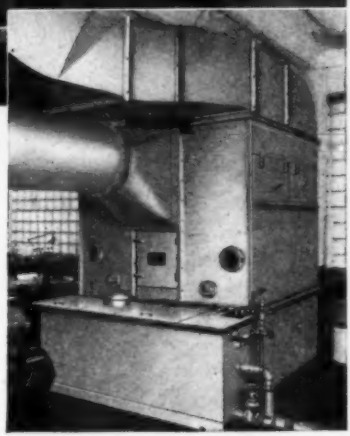

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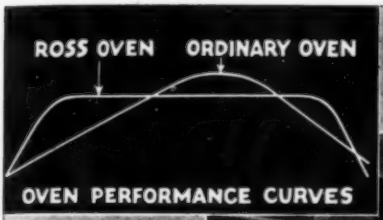

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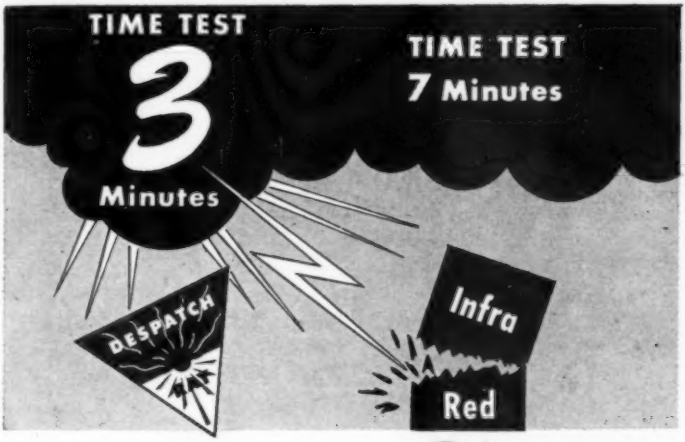

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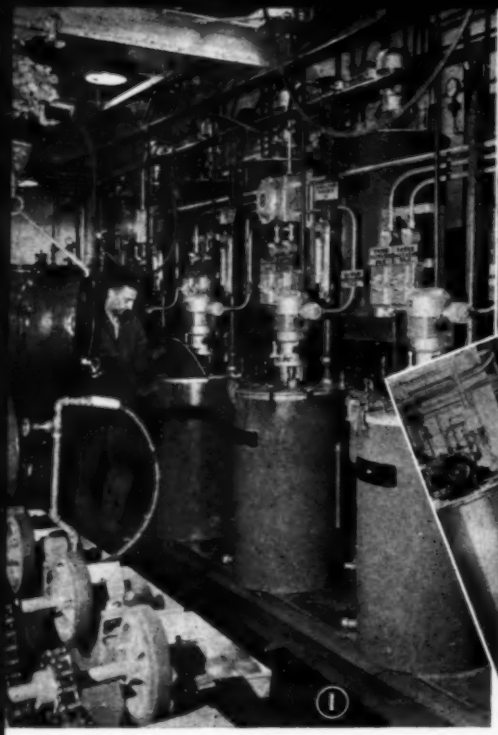
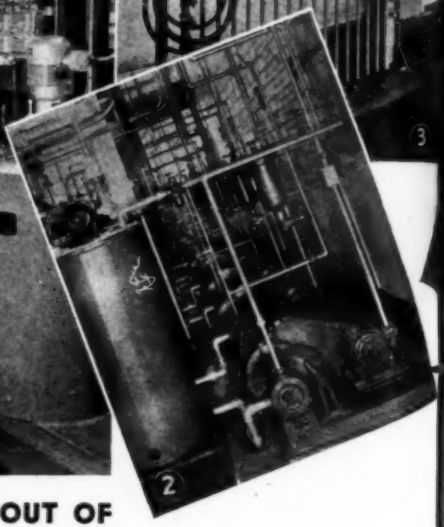
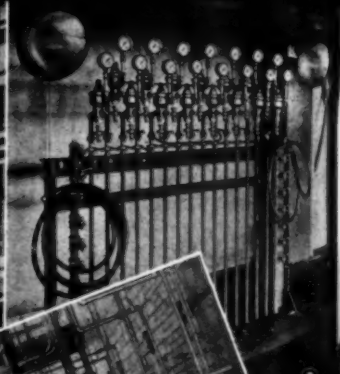






PLANNING THE LAYOUT OF

☆ An Efficient Paint-

IN MANY industrial plants that have sprung up or expanded during this great period of intensified war production, it is noticeable that paint, undercoats, surfacers, etc., now reach the operator through pipe lines. To obtain satisfactory results from such an installation, considerable thought must be given to the design and layout of the equipment. It is important that an individual well acquainted with the operation of a paint circulation system should be in charge of its planning, installation and early operation.

In the first place, a careful study should be made of the material to flow through the pipe lines. If it is at all possible, samples of the materials to be used should be submitted to the manufacturer of the equipment for tests of the material's abrasive-

Above: Tunnel-type booth with spray stations at both sides, served by the circulating paint lines. Photograph, courtesy of Binks Mfg. Co.

Left: Spraying metal cabinets at booths supplied by paint-circulating system. Notice pressure regulators and pressure gauges at each "take off." Photo, courtesy of The DeVilbiss Co.

No. 1 (Opposite page)—View in mixing room where material drums are handled with an overhead traveling hoist. Driven rollers at lower left rotate the drums to agitate their contents. Photograph from Binks.

No. 2 (Opposite page)—Motor-driven pumps which keep material circulating through circulating tanks and pipe lines. Notice the material filters, valves and other fittings. Photograph, courtesy of The DeVilbiss Co.

No. 3 (Opposite page)—Spray station served by "take-off" from circulating pipe lines located on lower floor. The large pipe at each side is an air header. Fluid regulators and pressure gauges are shown clearly. Photograph from Binks.

Circulating System ☆

BY WILLIAM W. LOMAN

ness, its tendency to settle out, and any other characteristics that must be known in order to select the proper valves, the most satisfactory type of pump, and other items upon which efficient operation of the system depends.

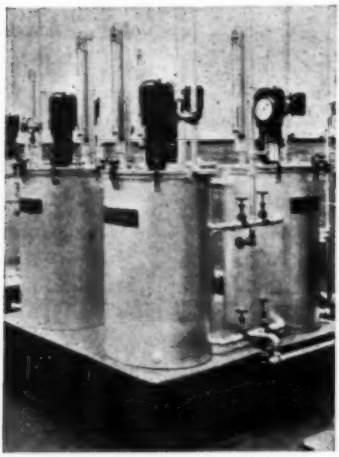
Many of the protective coatings developed recently, and covered by rigid Government specifications, are so abrasive that it has been necessary to develop pumps with special cylinder walls to handle them. In some cases, the filters that would handle most pre-war paints have had to be removed from the lines.

When planning the layout of a paint-circulating system, a survey should be made of the amount of material likely to be used, and

to be carried in stock. With this information it is possible to determine the size of a mixing and storage room of adequate area to receive the supply and mixing tanks, pumps, and a reasonable quantity of reserve materials. It is not necessary that the entire stock of material be kept in this room. However, what is stored here should be permitted to remain long enough for its temperature to become the same as that in the mixing room. Then the man responsible for mixing or blending materials will know that his viscosity tests are being made on materials of uniform temperature.

Layout of Mixing Room; Equipment Needed

Your mixing room should have what equipment is needed for easy and safe handling and storage of materials in drum lots. This should include a rack to receive drums of material, and a suitable hoist or portable elevator to load and unload the rack, or an overhead tramrail or crane to use in stacking the drums and selectively transporting them to the mixing tanks as they are needed.



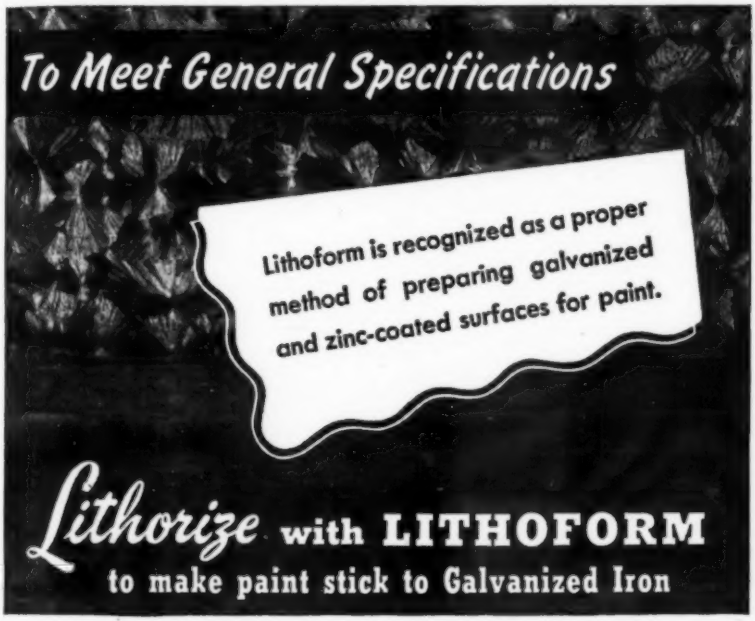
Part of a system of mixing and circulating tanks on concrete bases. Enclosed spark-proof motors drive agitators in drums; notice material depth gages too. Binks photograph.

Mixing and Circulating Tanks; Pumps; Agitators

Another important item to consider is a means of agitating the contents of a drum prior to mixing. This can be accomplished by placing the full or partly filled drum on a set of parallel rollers and turning it by power. Or, if the material is shipped in a drum that has an internal agitator, you merely clamp an air motor to the agitator shaft and stir the paint within the drum while the drum rests in an upright position.

The mixing and supply tanks, from which material is pumped through the circulating system, are usually arranged in two parallel rows. The mixing tanks are in the front row, while the supply or circulating tanks are in the back row. There is a mixing tank, circulating tank, and a pump for every color or different material used. The number of these units required depends upon the number of different colors or materials to be circulated to spray stations. A small factory may need only one or two units. A large plant may have as many as ten or more units, each with its complete circulating line. All tanks are equipped with explosion-proof, geared-head motors mounted on the top and connected to 2-bladed agitators.

Directly back of the tanks (unless this is prohibited by local safety regulations) are the pumps,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A single line paint-circulating system in use at a waterwash spray booth. Notice freedom of operation, and the absence of dirt and hazard because of the paint and air line take-offs. DeVilbiss Photograph.

one for each set of tanks. The pump motors are also explosion-proof motors and are controlled by explosion-proof push buttons which should be conveniently situated near the mixing tanks. Solvents and materials are measured into each mixing tank in the proper proportions and are agitated until the proper spraying viscosity is obtained.

After being properly mixed, the material is pumped through the pipe lines to all of the spray stations. The material travels in one direction to each spray station until it reaches the last one which uses that particular material, then it returns to the mixing room by the shortest route and re-enters the supply tank. When all material has been drained from the mixing tank a new batch is then mixed to be ready for use as soon as the previous batch reaches a low point in the supply tank.

Automatic Safety Valves; Fluid and Pressure Regulators

A safety valve should be placed in the line between the pump and the supply tank to relieve any excessive pressure that might develop because of dirty lines, clogged filters, etc. Should such a difficulty occur the valve automatically opens and by-passes the material from the discharge side of the pump back into the supply tank.

At each spray station a fluid regulator is installed on each line. This regulates, by means of a key-adjusted valve, the fluid pressure for each operator. At each spray booth, which has more than one spray station, the atomizing air pressure is supplied by a header extending the length of the spray booth. The air pressure is controlled by an adjustable regulator located above the booth. This is adjusted by a master key, which should be kept in possession of the foreman to prevent any meddling and tinkering by the operators. Observance of this precaution helps to insure the delivery of materials to all spray stations at a uniform pressure.

Material Pipe Lines; Safety Precautions; Cleaning

The material lines usually consist of 1-in. pipe, the proper size depending upon the number of spray stations, the viscosity of the material, and the length of the lines. A "must" to remember when installing circulating material lines is that all bends must be of

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reasonably large radius (a minimum of 12 to 15-in.). Smaller radius turns increase the resistance to an easy flow of material and thereby cause the pressure to drop. This, in turn, could allow a percentage of heavy pigments to drop out of solution and in time cause a clogging of the line and a reduction in the line pressure at distant spray stations.

Material lines should be flushed out at regular intervals, the frequency of flushing depending upon the material being used. Trouble can be averted by cleaning the pipe lines prior to a stoppage, rather than waiting for a noticeable pressure drop at the farthest spray station.

The circulating system will probably never entirely replace pressure paint containers. Pressure containers are useful in many small factories, and also in large plants where a relatively small production of special parts, etc., does not justify the expense of installing a paint-circulating system of large capacity. However, when we consider the better working conditions, the more uniform protective coatings obtainable, the fewer interruptions, and the saving of material, a paint-circulating system will often make up for its original installation cost in a remarkably short time.

Right Cleaning, Rinsing Minimizes Rejects

IN ANY wet metal-cleaning process the final rinse has an important effect on the corrosion resistance of the protective coating which is applied later. Regardless of what general method of cleaning is employed, the removal of the cleaning agent itself, together with the contaminants picked up from the metal, is a critical step in the cleaning operation. Water-soluble salts, objectionable acids and bases constitute the most usual and serious of the invisible, latently harmful surface contaminants that can destroy perfect adhesion of the prime coat.

Almost all cleaning chemicals contain such substances, which are absorbed more or less strongly by the steel surface, and are rinsed off with difficulty. It is quite difficult to keep rinse water free from these contaminants; besides, all natural waters contain dissolved salts. Obviously, whatever remains on the surface after the rinsing, and whatever is dissolved or suspended in the rinse water film adhering to the surface, still remains when the metal surface is dried. Traces of alkaline, saline and water-soluble material in general, even such amounts as may be present in tap water, if left on steel surfaces, are harmful to a paint film.

The final rinse following one or more rinses in clear water should be a neutralizing rinse (preferably hot to assist subsequent drying) and it should contain substances to neutralize and destroy any carried-over alkali or alkaline salt on the surface of the work, or present in the rinse water, so that no corrosion stimulative material will remain.

This final rinse should be on the acid side of neutrality, having a pH of between 3 and 5, and it should contain suitable agents to cause the rinse water to drain off in an even film without leaving droplets to dry irregularly on the surface.

It will appear that, regardless of the type of cleaning used, the

(Continued on page 59)

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THE THEORY AND USE OF *Zinc Chromate Primers*

BY PAUL O. BLACKMORE
Director, Products Engineering & Development Laboratories, Ault & Wiborg Division of Interchemical Corporation

Part 2 of a 2-part article in which the author reveals many interesting facts about zinc chromate primers—what they are made of; why used; how to select, control and use them to get the best results; what makes a primer adhere firmly and permanently to metal, and how it protects metal surfaces from destructive corrosion.

SOMETIMES finishers get a bit bored at the regularity with which their suppliers extol the virtues of careful metal cleaning. There probably have been times when dirty metal has been blamed for conditions that more properly could be charged to defective finishes. Dirty metal has, however, been the source of much finish failure. Let us, therefore, briefly consider the problem of adhesion in order to get a better picture of why metal cleaning is so important.

Of all the properties a good primer should possess, adhesion is the most important because all of the other functions are predicated upon the assumption that the primer will continue to remain in contact with the surface on which it is applied.

What Makes a Paint Film Adhere Firmly to Metal

Several years ago, the Federation of Paint and Varnish Production Clubs sponsored a research program at the Case School of Applied Science to determine the factors affecting the adhesion of paint films on metals. The work was done by Dr. George Selden under the direction of Dr. C. F. Prutton. The results were published in the Technical Proceedings of the Federation of Paint and Varnish Production Clubs in 1940 and 1941. According to Selden there are three factors controlling the adhesion of a coating to a metal surface.

A) Interlocking Phenomena

1) The film penetrates minute interstices and irregularities in the metal.

2) The film penetrates a surface film of oxide, carbonate, or phosphate on the metal.

B) Adsorption

One or more of the constituents of the film is adsorbed on the surface of the metal.

C) Chemical attack of the surface by a constituent of the film.

Adhesion is produced by a chemi-

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Fig. 2—"Smooth" steel magnified 3000 times shows a surface that is really favorable for good paint adherence.

cal combination between one or more ingredients of the film and the metallic surface.

Anchoring the Paint Film to Etched Metal

Of these factors, the interlocking phenomenon, or "intersticial adhesion" is probably the most important. The mechanics of interlocking are obvious. It is well known that the adhesion of a paint film may be improved by sandblasting or etching, thus providing additional interfacial surface as well as additional pores or interstices into which the coating can flow and anchor itself securely. It is in this manner that bonderizing and anodizing treatments contribute to adhesion.

The photomicrograph of the surface of a piece of steel (as shown in Fig. 2) illustrates the vast number of pits and crevices into which a finish may flow in order to gain a toe-hold. This piece of steel appeared very smooth to the naked eye. The photograph has been magnified 3000 times.

Surface Must Be Clean

It should be emphasized at this point that in order to make the most of the presence of surface irregularities and to employ the interlocking phenomenon to anchor the paint film, the surface must be chemically clean. If a drop of oil is placed on a blotter, water can no longer be absorbed into the blotter at that point because it cannot wet the fibers of the blotter and flow into the capillaries. Similarly, when a film of oil or other contaminant is present on the surface of the metal, the paint or enamel is prevented from wetting the metal and from flowing into the interstices. This barrier film may be invisible and only a few molecules thick, but that is quite thick enough for it to get in its destructive work.

How Adsorption Causes Paint to Cling to Metal

The second factor affecting adhesion, namely adsorption, is much less self-evident and not as well understood as the mechanical theory of interlocking. The latter phenomenon will serve to improve the adhesion of any paint film on a given surface. However, given a surface uniform in porosity and cleanliness, then adsorption is the phenomenon that makes some films adhere better than others. Adsorption is strictly a surface phenomenon. It involves the accumulation of the adsorbed material upon the surface of the adsorbing material, a process in which a layer of the adsorber only a few molecules thick

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may take part. This is in direct contrast to ab-sorption, in which the AB-sorbed material is accumulated within the entire mass of the AB-sorber, such as water in a sponge. Many people do not understand this difference clearly.

In order to understand the theory of adsorption it will be helpful to draw an analogy in the field of magnetism. It is generally conceded that an atom, which is the tiniest existing particle of matter, is composed of positive and negative electrical charges known as protons and electrons. The protons are clustered in a group forming the nucleus of the atom; the electrons revolve about this nucleus in their respective orbits exactly as the earth and other planets of the solar system revolve about the sun. The mutual attraction of the protons for the electrons serves to keep the latter in their orbits. The chemical and physical differences between various substances are due solely to the number and distribution of the electrons and protons of which its individual atoms are composed.

Positive and Negative Electrons in Atoms

When a chemical reaction takes place between two or more substances, it is thought that electrons are given up from an orbit of one substance and are gained by another. When an electron, being a negative charge, leaves an orbit of one atom and enters that of another, the atom which it left becomes more positive in character due to the loss of that electron, and the atom into which it enters becomes more negative for having gained it. Thus, matter can be defined as a conflict of electrical forces, and it is thought that these

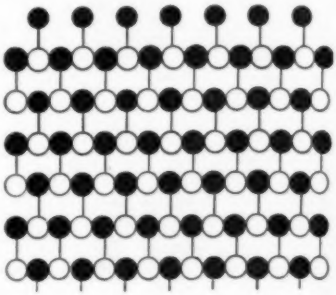
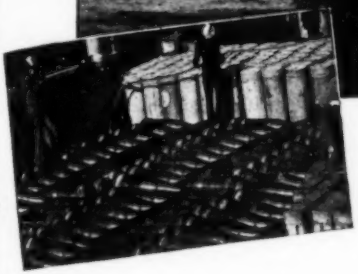


Fig. 3—At the surface there may be a concentration of a certain polarity.

forces present within the body of a substance in some manner influence its surface characteristics.

Assuming that like charges repel each other and unlike charges attract, we can therefore picture an orientation of molecules within a substance in much the same manner as iron filings assume the direction of the magnetic lines of force when a sheet of paper upon which they have been scattered is placed over a magnet. Within the body of the substance these charges are presumed to be in equilibrium by virtue of their being neutralized by the surrounding charges of an opposite character. At the surface of the substance, however, there may be a concentration of a certain polarity as shown in Fig. 3.

When a paint film is applied upon such a polar surface, if there are any constituents in the film whose molecules are attracted by opposite polarity to the polar surface just described, these molecules will, in turn, orient themselves in magnetic fashion. Thus, by causing the polar forces of the painted body to extend into the paint film by virtue of their at-



U. S. Navy Official Photos

ORDNANCE "Spec" Primers

No. AXS-946 No. 3-183

for Steel Shells, Bombs, Cartridge Cases

Here are two specification finishes with the usual Egyptian plus. They meet every requirement from Uncle Sam's standpoint and every requirement which you set as to speed, ease of application, drying and appearance.

Apply to bare metal by spray, brush or dip. Sprayed on, they air-dry in 10 minutes for handling and top coating with enamel. If desired they can be baked 10 minutes at 250 degrees F.

THE EGYPTIAN LACQUER MANUFACTURING COMPANY ROCKEFELLER CENTER, NEW YORK 20, N.Y.

EGYPTIAN FINISHES

EGYPTIAN

SUPERIOR FINISHES

traction for one or more of its constituents, we have set up a strong bond between the two.

The fact that polar forces within the body are in equilibrium and the concentration of the polarity can occur only at the surface, or very close to it, explains the statement that adsorption is a surface phenomenon. Again, I should like to emphasize that a very thin film of oil or dirt is many times thicker than the molecular distances which govern the phenomenon of adsorption. Therefore, unless the metallic surface is meticulously clean, one cannot expect to derive any benefit from the polar attraction of the molecules.

Chemical Attack of Metal by Paint

Chemical attack of the surface by a constituent of the film, the third factor affecting adhesion, is more often than not likely to prove harmful rather than beneficial. Zinc, for example, reacts with the organic acids present in oils and resins to form compounds known as zinc "soaps." Their name accurately describes their character. They are mushy, soapy compounds and when they form at the film-metal interface they destroy the adhesion just as surely as if the surface had been coated before painting with a film of your favorite laundry soap.

Inorganic acids such as phosphoric, on the other hand, may etch the metal and form a coating of an insoluble phosphate, thus increasing both the adhesion and corrosion resistance.

Metal Surfaces Must Be Clean to Receive and Hold Paint

To summarize our discussion on adhesion, then, let us say that:

1) An etched sandblasted, or otherwise roughened surface provides a greater area to permit mechanical adhesion to take place by virtue of interlocking, as well as a greater area over which the strong polar forces of adsorption can exert themselves.

2) The surface must be chemically clean to permit the paint film to wet and flow into the interstices as well as for the adsorption forces to exert themselves. Inasmuch as these forces are active to a depth of only a few molecules, a slight film of grease or dirt might easily be thick enough to bury them and render them inactive.

3) Interfacial chemical reactions are to be avoided if they go beyond a slight etching of the surface, and they must form no undesirable end products such as the zinc soaps mentioned above. Reactions within the film are also undesirable. Films should be resistant to further oxidation, polymerization, and reactivity between pigment and vehicle, once a satisfactory cure has taken place.

Conditions (1) and (2) are the responsibilities of the person doing the finishing, and it is hoped that this discussion has forcefully shown the need of doing that part of the job thoroughly and carefully. Condition (3) is the responsibility of the finish manufacturer who can assume it with confidence if he understands the chemistry of what goes on between the metal and his paint films.

It is not a function of this paper to discuss the various cleaning methods and their relative merits. There are many good ones available, and there are metal cleaning engineers whose job it is to survey a problem and recommend the best materials and procedures for

Custom Tailored
For
AMERICAN EXPORT AIRLINES'
FOUR-ENGINE
"FLYING ACES"

FINISH BEATS CORROSION

● Out of ALAKA Laboratories has come a clear, protective finish . . . custom tailored to prolong the lives of American Export Airlines' powerful Pratt & Whitney engines . . . the hearts of their "Flying Aces".

And what a devil's potion the propellers feed back to those engines. Deluges of salt water . . . ethyl alcohol and glycerine (de-icing fluid) . . . bullet-like hailstones at 215 miles per hour . . . snow and tropical rains . . . all can be a part of a single day's diet on the 11,500 mile, 4-continent route.

But this finish can take it all . . . salt water, ethyl alcohol, high octane gas, lubricating oils etc. Air-dried in less than an hour, this finish was tested for over 300° F. by American Export Airlines. (Actually it can stand much more.) After it was sprayed on the various metals of the engines . . . aluminum alloys, steel, magnesium and copper . . . the engines were put back into service and the finish came through with a perfect score.

Send for your co

Write us on your letterhe we will send you a copy new, complete, up to the catalogue of U. S. Gov Specification Finishes.

WHATEVER YOUR FINISHING PROBLEM

ALAKA

Custom Tailored Finishes
TO FIT YOUR REQUIREMENTS

ALAKA
IN CHEMICAL LACQUER

LACQUER & CHEMICAL CORPORATION — 220 FORTIETH ST., BROOKLYN 32, N.Y.

accomplishing the task. There is also a wealth of information in the literature, if one cares to look.

Know Certain Facts to Avoid Foolish Mistakes

Before leaving metal preparation, however, it might be well to leave one additional thought. I have pointed out that zinc chromate primers function by means of ionization, and the setting up of controlled galvanic currents. This is a phenomenon that takes place between METAL IONS. Any chemical metal treatment that deposits an insoluble, un-ionizable surface coating will prevent the zinc chromate from functioning. *Therefore, it does not make too much sense to use a zinc chromate primer over a phosphate coating such as Bonderizing, for example, unless you are the kind of a pessimist who wears both a belt and suspenders. One really does not need both.*

Some time ago I visited the plant of a manufacturer who, in order to gain improved adhesion, was applying a clear varnish size to the metallic surface, following this with a zinc chromate primer and then a top-coat. The folly of this procedure is quite evident when one considers the theory of zinc chromate primers. By deliberately creating a barrier between the metal ions, he made it utterly impossible for the primer to function. His problem was to find out why his zinc chromate primer did not develop adhesion.

Thinning Z. C. Primer for Spraying and Dipping

Having now obtained a carefully cleaned metallic surface on which we can apply our primers, let us turn our attention to the preparation of the primer for application.

Few zinc chromate primers are supplied at a consistency ready for dipping or spraying. As mentioned above, the settling problem is a real one, and manufacturers cannot take the risk of encountering poor package stability by shipping the material ready for use. Therefore, some reduction will be needed. Since package consistency varies from one specification to another, and indeed, from one manufacturer to another supplying material on the same specification, it is impossible to make any blanket recommendations for reduction. It is suggested that, in every case, the recommendations of the supplier be carefully followed.

He knows best what quantities and types of reducers his primer will tolerate.

Whether or not it is fast or slow will depend on the requirements for drying time and flow. Whether or not it is strong or weak will depend on the requirements of the vehicle the manufacturer has used in formulating it. In general, the fast-drying primers require solvents with a high degree of aromaticity, such as toluol, xylol, hi-flash naphtha, or some of the hydrogenated petroleum solvents. The slow-drying or baking primers *may* tolerate substantial amounts of the weaker aliphatic hydrocarbons.

Selection and Use of Solvent

The selection of the proper solvent is important, not only from the standpoint of performance, but also from the manner in which it may affect flocculation and settling tests. Tests have repeatedly proved that it is perfectly possible for the same primer, reduced with three different types of solvents, to turn in three different types of performance in the settling test, ranging from very good to very bad. *(To page 48)*

Half of this motor housing is finished with Modern Texture, the other half is unfinished. Note how Modern Texture camouflages rough cast or machined surfaces.

Lowe Brothers Modern Texture Finish For Motor Housing and Rough Castings

MODERN TEXTURE *Finish has many outstanding characteristics which make it an excellent finishing system for motor housings, machine tools and other cast iron equipment where the cost on a smooth filled job is prohibitive.* **MODERN TEXTURE** *eliminates filling and sanding, requires no baking and yet produces an excellent finish with either two or three coats.*

MODERN TEXTURE *was developed by Lowe Brothers to meet the emergency resulting from Limitation Order L-108 which prohibited filling operations in the finishing of fine machine tools. Result, this pebble finish which perfectly camouflages the rough cast surface and gives a tough protective finish yet fully complies with the Limitation Order. Lowe Brothers, the creators of fine finishes used on machine tools before the war, developed* **MODERN TEXTURE** *Finish as a timely answer to your finishing problems.*

INDUSTRIAL SALES
THE LOWE BROTHERS CO.
DAYTON, OHIO

Lowe Brothers
WARTIME FINISHES *for Industry*
IN ACCORDANCE WITH U. S. GOVERNMENT SPECIFICATION

The amount of solvent to be used will, of course, depend upon the type of application and the type of performance expected from the primer. Since the amount of reduction is one of the factors governing the film thickness attained per coat, and this film thickness is, in turn, a factor governing the degree of protection afforded by the primer, it follows that over-reduction may seriously affect the durability of the system.

Film of Z. C. Primer Can Be Too Thin or Too Thick

There is a widespread popular belief that primers should be applied in a very thin coat, and that if, in the process of application, a few spots are missed completely, the top coat will cover it up anyway and no one will be the wiser. Where a primer is used solely to provide a better adhesive bond for the system, this may hold true. However, where a primer is used as part of the fight against corrosion, unless the film thickness is adequate and uniform, the battle will be lost because of an enemy break-through at the weakest point in the line of defense. The top coat may hide that weakness from a human observer but it cannot hope to deceive the forces of corrosion.

In a study recently conducted on primers for magnesium, a set of over 100 panels immersed in 5% sodium chloride solution indicated conclusively that primers whose film thickness was less than .7 mils failed by blistering regardless of how good a vehicle or pigment combination they contained. By the same token, some of the poorer primers, at high film thickness, performed more satisfactory than some of the better ones at low film thickness. This is not surprising. If a more impenetrable barrier is formed by virtue of the additional film thickness, then less of the corrosive elements in the environment can reach the metal to create the havoc.

It is not always possible to apply this much primer. If painted pieces are to be fabricated, they will fabricate more readily if the films are thin. Air-drying and baking schedules are extended and, of course, costs are higher as the film thickness is increased. In the case of aircraft, there are weight limitations. Again, it resolves itself into which property is most desired. If the answer is protection against corrosion, do not skimp on the primer coat.

Testing Viscosity and Certain Other Characteristics

In regard to reduction, then, as well as to viscosities for dipping and spraying, and air pressures at the gun and in the pressure tank, drying schedules, etc., no general recommendations can be made to cover zinc chromate primers as a class. Each customer and end use constitutes a different problem. Your paint supplier is the best source of information for answers to those questions.

The care of zinc chromate primer in a dip tank is, however, a subject about which some generalities may be made. Earlier in this discussion I indicated that zinc chromate is classed as a vehicle-reactive pigment, and that vehicles of low acid number should be chosen to insure good package stability. This statement applies equally well to the question of stability in the dip tank. In addition, there are the problems of settling and oxidation. Settling is, of course, accelerated with a reduction in viscosity. *(To page 52)*

For Signal Corps Equipment

MURPHY

IFR LACQUER 5531

(Insulating, Fungus Resistant)

This lacquer meets *all* the requirements of Tentative Specification 71-2202-A, the most important of which are:—water vapor diffusion...dielectric strength...salt water immersion ...resistance to thermal shock...mold and mildew resistance ...and the effect on coated or adjacent parts.

No. 5531 offers this production advantage:—it exercises no deteriorating effect on "spaghetti" tubing and wax capacitors found in radio equipment. Actually dries over wax—a most unusual performance which prevents electrical leakage. It will not "lift" such coatings.

Fast dry—suited to brushing, dipping or spraying.

Write for complete information on IFR Lacquer 5531 and other Signal Corps Finishes.

MURPHY VARNISH COMPANY

NEWARK SAN FRANCISCO CHICAGO

MURPHY *Protective* COATINGS

GUNS

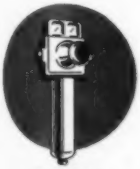
for non-combat planes, too . . . .

Pictured at the right is a Pan American Airways DC-3. These sturdy Clippers, formerly used as commercial passenger ships, fly to Alaska, Mexico and South America . . . they accommodate 23 passengers and crew. Many of them are now in full-time Government service speeding military personnel on missions of vital importance to the war effort . . .

Like all equipment that is in constant use these silver giants must be kept in excellent condition. An important phase of such maintenance is taken care of by Binks spray guns, booths and accessories, which quickly, effectively and economically provide any required finish, from the exterior of the plane itself to the smallest interior part or surface.

PAA

P.A.A.'s new Miami hangar, used to house its silver-winged, globe-girdling Clippers.



Over the nation Binks spray painting equipment is helping speed the war effort . . . as in peacetime, Binks engineers are constantly devising new machines and techniques which are tailor-made to meet the specific requirements of the job at hand . . . spray painting equipment has been developed to keep step with the greatly accelerated war production of planes, shells, jeeps, tanks, bombs, heavy and light machinery of all types. Devoting 100 percent of its time to the war effort, Binks Manufacturing Company is, at the same time, gaining invaluable experience in preparation for the important job of meeting the peacetime requirements of America's postwar industry. No matter how intricate or difficult the job—Binks can "finish" it. Write today for your copy of Binks helpful catalog-data book. And remember, there is a Binks engineer in your neighborhood whom you are invited to consult without obligation.

BINKS

MANUFACTURING COMPANY

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NEW YORK · DETROIT · SAN FRANCISCO · PHILADELPHIA · PITTSBURGH · CLEVELAND
ST. LOUIS · MILWAUKEE · BOSTON · LOS ANGELES · SEATTLE · WINDSOR, ONTARIO, CANADA

Agitate Material in Dip Tank

Dip tanks should be equipped with agitators to keep the contents of the tank in mild motion. Preferably they should be bar type agitators slowly moving to and fro along the bottom of the tank to prevent the accumulation of a heavy pigment sludge. Agitation violent enough to entrap large quantities of air is to be avoided for two reasons. Air bubbles entrapped in the film create a weak spot in the protection. Furthermore, excessive aeration accelerates oxidation of the material in the tank. As oxidation increases, solubility decreases and stronger solvents may be required to prevent the tank from becoming "seedy" or, in extreme cases, throwing out completely.

When the dip tank is first filled with primer and a suitable dipping viscosity has been established, the following facts should be recorded:

1) Viscosity of tank in seconds or centipoises.

2) Temperature at which that viscosity exists, and—

3) Weight per gallon or gravity of the reduced material.

As the material in the tank is consumed, additional primer or additional reducer is added, or both.

If the material is behaving properly, the weight per gallon will remain the same when the proper viscosity is reached at each adjustment. If the viscosity remains the same but the weight per gallon drops, it is an indication that the material in the tank is becoming less soluble (due to oxidation) and is requiring more reducer to maintain the viscosity. This is a danger signal and your paint supplier should be notified. The remedy is generally to be found in the use of a stronger reducer until the original constants of the tank have been restored. If this fails to arrest the trend, a change in formulation is indicated. A tank can usually be saved, however, if the trend is observed in time.

Excessive Pigment Settling; Influence of Temperature

Excessive pigment settling is also manifested in a reduction of the weight per gallon. Thus it will be seen that control of a dip tank by means of viscosity alone is not sufficient. One can always arrive at the proper viscosity by juggling the additions of fresh primer and reducer, but the question of whether or not you have the proper percentage of solids at that viscosity can be determined only by a determination of the weight per gallon or, better still, by a solids determination.

Temperature was mentioned as part of the dip tank data to be recorded and maintained. It is a well-known fact that all liquids increase in viscosity when cooled and decrease when warmed. If the dip tank is subject to only minor temperature variations, the effect may be disregarded; however, compensation should be made for variation of over 20°. It is seldom possible to heat or cool the tank, but samples taken for viscosity determinations should be artificially adjusted to the standard temperature.

Determining and Controling Viscosity of Material

The determination of viscosity is simple. It is already widely used as a method of control in most finishing rooms. A wide variety of viscosity cups is available, the simplest one being crucible shaped and equipped with a long handle

NEW "SILVER SIX" IN ZAPON DURANITE FINISH
Illustrated is one of Yale & Towne's new "Silver Six" Line of Padlocks
YALE
This spring, in thousands of hardware stores throughout the country, customers will eagerly admire the newly launched "Silver Six" line of padlocks made by Yale & Towne. And the remarkable finish that gives them their name is S-277 Duranite.
A thorough study was made by Yale & Towne of S-277 to make sure it would stand up against all the conditions to which such a utility item as a padlock is subjected. After extensive tests for resistance to salt spray, humidity and abrasion, and also careful consideration of the very important factor of costs, S-277 "got the job."
It will be worth while to stop at your hardware store and get one of these handsome locks, look it over carefully and then subject it to tests. You will then appreciate the qualities of durability and beauty that appealed to the padlock manufacturer.
DURANITE—Trade Mark
EASTERN SALES:
ZAPON DIVISION
ATLAS POWDER COMPANY
Stamford, Conn.
ZAPON
WESTERN SALES:
ZAPON-REVOLITE DIVISION
ATLAS POWDER COMPANY
North Chicago, Ill.
INDUSTRIAL FINISHES

HERE is an advertisement which appeared in April, 1940. Due to wartime conditions, this finish has not been available. It may now be obtained, however, on an AA-5 or better. The same fine qualities which made it a favorite before the war are now continuing to increase its popularity during and after the war.

INDUSTRIAL FINISHES ... *For Your Products of Tomorrow*

to facilitate its use. The hole in the bottom may be ⅛-in. in diameter or less. The size of the hole or the volume of the cup is not important, except that if the volume is too small and the hole too large, the total time for the cup to drain will be too short to permit accurate readings and the cup will be less able to detect small differences in viscosity. Viscosity readings, in order to be accurate, should not be much below 20 seconds.

Such a cup gives a reading that is purely empirical and means nothing to anyone but its owner, or someone possessing an identical cup. The dip-tank operator or sprayman is rarely interested in knowing the actual viscosity of the material in centipoises. When he knows that he has adjusted his tank to its original constants, his interest ends and in such instances a simple, homemade cup is quite adequate.

It is always a good idea, however, to be sure that you are talking the same language as your supplier, and in that case it may be worth while to spend the money for a standard cup of some sort. Your supplier will be glad to tie your control in with his.

Weight Per Gallon or Specific Gravity

Weight per gallon is merely another way of saying "specific gravity." Knowing one, you can determine the other merely by consulting a set of tables or making a simple calculation. In the specific gravity tables, water is given a value of 1.0000, and all other values are established in relation to water. Since water weighs 8.33-lbs. per gallon, if we multiply the specific gravity of a liquid substance by 8.33 we get the weight per gallon of that substance.

The simplest method of determining weight per gallon is by means of a hydrometer. The hydrometer reading can be converted to pounds per gallon by consulting the tables. Again, temperature variations influence the result but may be disregarded within narrow limits.

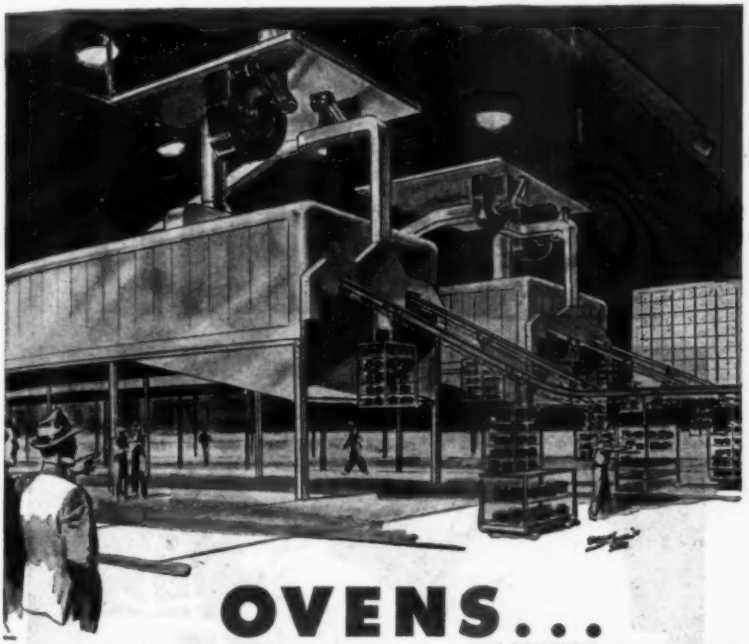
Another method is to fill a cup of known volume with the liquid in question, and weigh the contents on an analytical balance. A factor can be computed for the cup which, when multiplied by the weight of the contents in grams, will yield the weight per gallon.

Simplify Your Tests; Follow Specifications

We have emphasized the control of viscosity and gravity because those two constants are important to the maintenance of the dip tank. Many other tests are required by the specifications. These, however, are to establish the quality of the original material as received from the supplier, and it is his responsibility to run them and to make his product conform to the specification. Most of these tests are too complicated and time-consuming to form a part of the finishing room routine. If your organization includes a technical department, with the manpower and equipment to run them, it is a good idea to do so, particularly if there is reason to believe that the primer is not performing as it should. The specifications give detailed directions for the procedure and equipment involved in making these tests, so therefore it is not considered part of the scope of this discussion to include them.

I was asked to write a story for INDUSTRIAL FINISHING magazine

(To page 59)



OVENS . . .

ANY SIZE . . . SHAPE . . . OR TEMPERATURE RATING
DESIGNED AND BUILT TO YOUR REQUIREMENTS

Gas or Oil Fired . . . Electric or Steam Heated

Impressive evidence of Mahon ability to produce *special-purpose* oven equipment is demonstrated by the hundreds of installations now in successful operation. The ovens shown above are typical. During the past two decades, Mahon engineers have encountered and successfully mastered hundreds of complex oven problems. The result is a vast store of valuable data on processes and methods—and many important improvements in oven construction—safety devices—controls—and heating. In every industry where ovens are essential to product finishing, this wealth of information is being utilized to step efficiency up and keep cost of production at the lowest possible level.

Let Mahon experts participate in the solving of *your* oven problems—whether your need is a single installation or a complete rehabilitation of your oven equipment. It involves no obligation—and you will find the information disclosed by a survey of your plant and product decidedly helpful and profitable.

THE R. C. MAHON COMPANY
DETROIT 11 CHICAGO 4

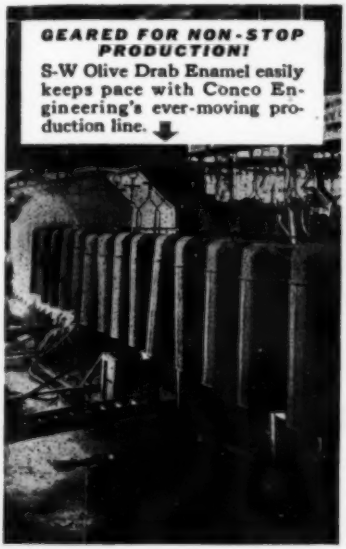
Manufacturers of Metal Cleaning Machines • Rust Proofing Machines • Hydro-Filter Spray Booths • Ovens of All Types • Filtered Air Supply Units • Hydro-Foam Dust Collectors—and Many Other Units of Special Production Equipment—including Complete Finishing Systems

BUILT FOR BLITZ!

FINISHED FOR FRONT-LINE ACTION!

The "Blitz Can" is a baby of modern mechanized warfare. Standard equipment on jeeps, tanks, trucks — these 5-gallon portable containers carry oil, gasoline, water, soup and similar emergency supplies. They see plenty of front-line action that makes heavy demands on the finish!

SHERWIN-WILLIAMS


GEARED FOR NON-STOP PRODUCTION!
S-W Olive Drab Enamel easily keeps pace with Conco Engineering's ever-moving production line.

MADE TO TAKE IT!
S-W Specification Enamel, used to spray inside of "Blitz Cans" is *formulated* to fight powerful corrosive solvents.

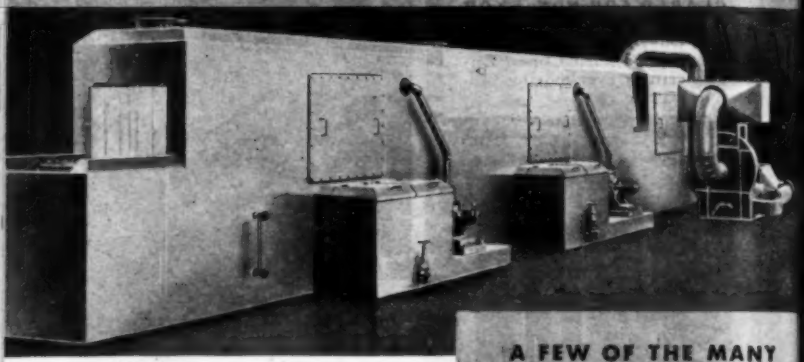
"Blitz Cans" by Conco Engineering Works Mendota, Illinois get a quick Battle Finish

PROTECTIVE COATINGS for Army "Blitz Cans" are a two-way proposition. They must protect the exterior of the can from exposure and hard wear and the interior from corrosive solvents. In the field, Sherwin-Williams "Blitz Can" finishes, used by Conco Engineering Company of Mendota, Illinois, take the beating and battering of modern warfare. On the production line, they perform just as handsomely. Formulated for modern finishing methods, both exterior and interior coatings handle with extreme *speed* from start to finish.

Today, all standard Sherwin-Williams Finishes — whether for wartime or peacetime use — are geared for low-cost, high-speed production. See us for finishes that can help you do a better job — *faster!* The Sherwin-Williams Company, Cleveland 1, Ohio.

INDUSTRIAL FINISHES

IN *Any* SPRAY WASHER



TRIAD ALKALI AND EMULSION CLEANERS

Will Assure GREATEST EFFICIENCY and ECONOMY

ou can operate the finest spray washer equip-ent ever built, but without the proper cleaner our final results will be far from satisfactory.

riad Cleaners are supplied in different types—ach specifically suited to a particular cleaning pplication. By their use, you can be sure that ou are getting thorough cleaning action in our spray washers. A Detrex service man will e glad to recommend the material required or your cleaning.

GUARANTEED PERFORMANCE. Triad Cleaners are shipped on a guaranteed performance basis for thorough test in your production.

A FEW OF THE MANY TRIAD CLEANING APPLICATIONS

- *Cleaning of machined parts for inspection and temporary rust-proofing.*
- *Cleaning prior to and after heat treating.*
- *Cleaning before painting.*
- *Cleaning in the spray bonderizing process.*
- *Cleaning aluminum parts—stamped extruded, forged or cast.*
- *Cleaning after buffing or Magnaflux.*

Illustrated below are parts before and after removal of Magnaflux.

DETREX CORPORATION

13019 HILLVIEW AVENUE • DETROIT 27, MICHIGAN

BACK THE ATTACK
BUY WAR BONDS

on Zinc Chromate Primers and have, therefore, confined my remarks to this subject. It would not be fair, however, to close the discussion without calling attention to the fact that while zinc chromate primers, although relatively new in the field, have given an excellent account of themselves, we also have several old standbys that also have turned in an excellent performance record.

For exterior exposure on structural steel or for underwater protection, etc., primers containing red or blue lead, lead chromate, or zinc dust are still going strong and are hard to beat. Primers for aluminum and magnesium containing chromates of barium, strontium, or selenium are also attracting considerable attention. If your products of manufacture are covered by specifications calling for a certain zinc chromate primer, you must, of course, use it. If they are not, consult your paint supplier. More than likely he will have some good suggestions to make.

Pflug Promoted by Detrex Corporation

The Detrex Corp., Detroit 27, Mich., announces the appointment of R. W. Pflug as Manager of the company's Central Region territory which comprises the states of Michigan, Ohio, Indiana, Kentucky and West Virginia.

Mr. Pflug was previously manager of sales and service in the North Central Region. New larger branch headquarters have now been established in Detroit as well as in other principal cities which will facilitate the handling of orders and service, thereby speeding metal cleaning assistance of industry.

P. W. Moehle, as Divisional Manager, will coordinate service and sales in the southern section of the Central Region covered by the Dayton Branch office.

Detrex Corp. manufactures Detrex solvent degreasers; Alkali, emulsion and petroleum spirits washers; Triad alkali cleaning compounds, and Perm-A-Clor and Triad degreasing solvents.

Right Cleaning, Rinsing Minimizes Rejects

(Continued from page 36)

nature of the final rinsing solution has a profound and critical effect on the corrosion resistance of a final finish or paint job.

Cleaning in a properly formulated phosphoric-acid type of cleaner offers certain elements of safety in this connection. Rinsing in tap water is less harmful on surfaces cleaned with such a cleaner.

In order to secure the maximum benefit of an organic finish, the final rinse should contain phosphoric or chromic acid, with additional draining and drying agents. The final rinse must be on the acid side of neutrality. The optimum pH range for maximum film durability is from 3 to 5.

The effectiveness of chromic or phosphoric acid in overcoming difficulties due to absorbed soluble impurities on steel surfaces is improved when these are used in the form of properly formulated preparations designed for thorough contact with the surface, uniform drainage and more rapid and uniform drying.—*American Chemical Paint Co.*

Weber Named Glidden Advertising Manager

Appointment of Elmer L. Weber to the position of Advertising and Sales Promotion Manager of the Paint Division of the Glidden Co., Cleveland, Ohio, is announced by the Company. Mr. Weber has had many years of successful experience with two other concerns in Cleveland. He is currently secretary of the Sales Executives Club of Cleveland.

In joining Glidden, Mr. Weber succeeds P.L.Lotz, who was relieved of the advertising post at his own request and will transfer to California for special sales work with the Glidden Pacific Coast Division.

Down Draft Exhaust

FOR SPRAY PAINTING

BY PETER WOOD

IN THE past few years the problem of exhausting air over large machinery and other bulky products during spray painting operations has come to the front. It has always been known that paint particles, suspended in mid-air, will fall to the floor by force of gravity unless air currents strong enough to overcome the force of gravity are employed to carry those paint particles horizontally or upward to an exhaust duct or stack. Naturally, the paint particles from overspray can be moved straight down with less applied effort from exhaust fans, than would be required to carry them horizontally or straight up.

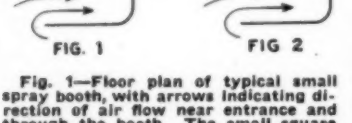


FIG. 1 FIG 2

Fig. 1—Floor plan of typical small spray booth, with arrows indicating direction of air flow near entrance and through the booth. The small square marked "A" shows about the usual location of any article being sprayed. Note that this is well within the confines of the wind tunnel (sides of booth) wherein the rate of air flow should be 150-ft. per minute to carry waste spray to and through the exhaust pipe E, at rear.

Fig. 2—Same as Fig. 1, except that object "A," to be sprayed, is moved out 2 or 3-ft. in front of the booth. Naturally, at this point, the rate of air flow is much less. If the air suction within the booth is just enough, then out here it wouldn't be adequate.

Another thing: When the problem of spray painting heavy bulky machinery comes up, you may have machinery parts which are so heavy that they must be handled by overhead cranes. If a part weighing three or four tons should swing slightly out of control or out of line and hit the spray booth walls, it might completely demolish the booth.

To take care of conditions like or similar to those just pointed out, down-draft spray booths have been developed for installation under heavy steel grates in the floor. Exhaust fans below the grates produce a suction of air at floor level, to aid the force of gravity in pulling waste spray down through the floor grates and then forcing it through exhaust ducts.

An Engineering Problem; Results Depend Upon . . .

On the basis of this principle you can have an efficient set-up, or you can be stuck with something that is costly but disappointing in results. To be sure of getting a practical and satisfactory down-draft spray booth, your problem should be given careful study, after which the installation should be planned, laid out and put in under the supervision of an experienced well-informed engineer.

While it might appear that less exhaust air would be required to make a satisfactory down-draft installation, this notion proves to be false when carefully analyzed. To

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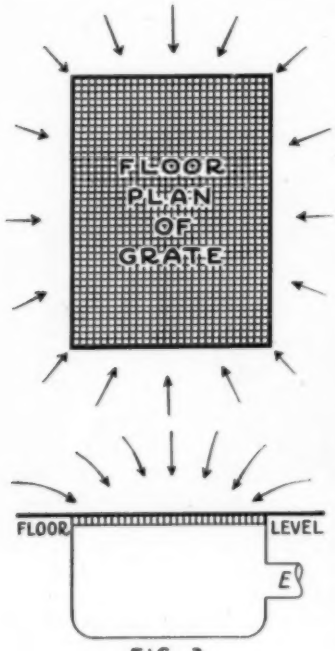

FIG. 3

Fig. 3—Floor plan and cross sectional views of down-draft booth, with steel grating over the face of booth. If there is no wall near this grated area, the air will rush in through the grates from all directions, most of it at floor level, as indicated by arrows. Here the object to be sprayed must be placed above the steel grate, which is outside the wind tunnel, as shown in Fig. 2.

make this point clear and understandable to everyone, let us consider a standard cabinet-type spray booth located above the floor, with exhaust air moving through the booth in a horizontal plane. This type of spray booth has height, width and depth. In the back of the booth are one or more exhaust fans. In reality this spray booth is a short wind tunnel with four sides (a floor, a top and sides at right and left).

Where Suction Is Strong and Where It Is Weak

Long experience has established the fact that we must have an air movement of about 150-ft. per minute through the booth to support sprayed paint particles of synthetic enamel and carry them through the air the length of an average spray booth. The important fact here is that the spraying and overspray must be within the dimensional limits of the booth (within the sides of the tunnel) or let us say, not beyond the face of the booth to be within the 150-ft. air movement.

It is also well known that we can not expect to get adequate suction of air when we spray, let's say 4-ft. to 10-ft. out in front of the spray booth opening. The velocity of air suction at any point several feet in front of the spray booth opening is relatively low, depending upon various conditions, one of which is booth location.

To compare this efficient cabinet-type booth to the down-draft floor-type booth, let us assume that we lift the cabinet booth into the air, turn it 90° so it will be face up, and then lower it through an opening in the floor and into a pit under the floor. Over the opening we place a strong steel grate at floor level. Now, with this setup, your spray man will have to do all of his spraying over the grate, which is beyond the dimensional limits of the booth—sometimes by as much as 4-ft. to 10-ft.—where the air suction is considerably weaker and therefore less effective than the 150-ft. per minute draft within the walls of the booth. Of course, the closer

(To page 68)

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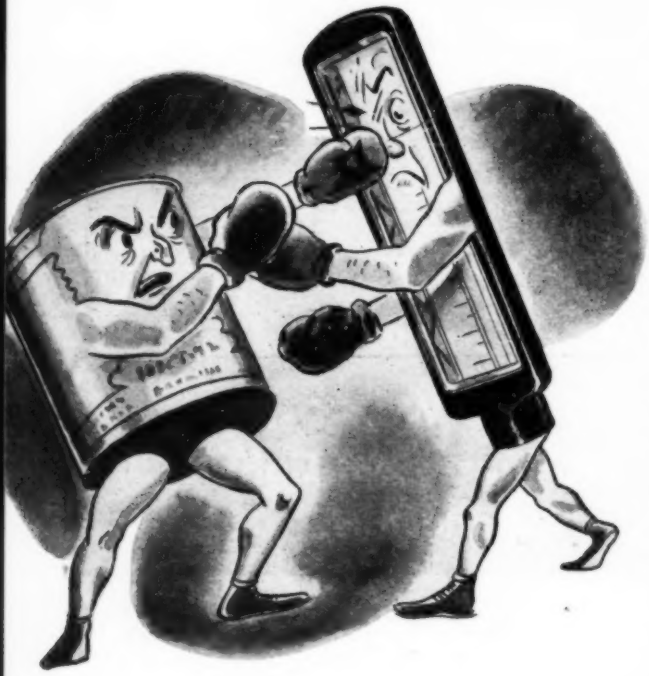

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T MAN'S SOME CHECKING. He decided olution of the problem depended on two) a varnish that would not blister at a high- re bake and (2) a metal temperature in Red oven sufficiently high to complete the minutes. Out of his broad experience and knowledge came suggestions for remedy- ouble.

SFUL SOLUTION. The steel was first sprayed *ecially formulated* finish. Then the Infra-Red oven was adjusted to develop a temperature high enough to bake the finish completely in 9 minutes without blistering. The extra 20 minutes were cut from the finishing cycle. Handling delays were eliminated. Production was increased.

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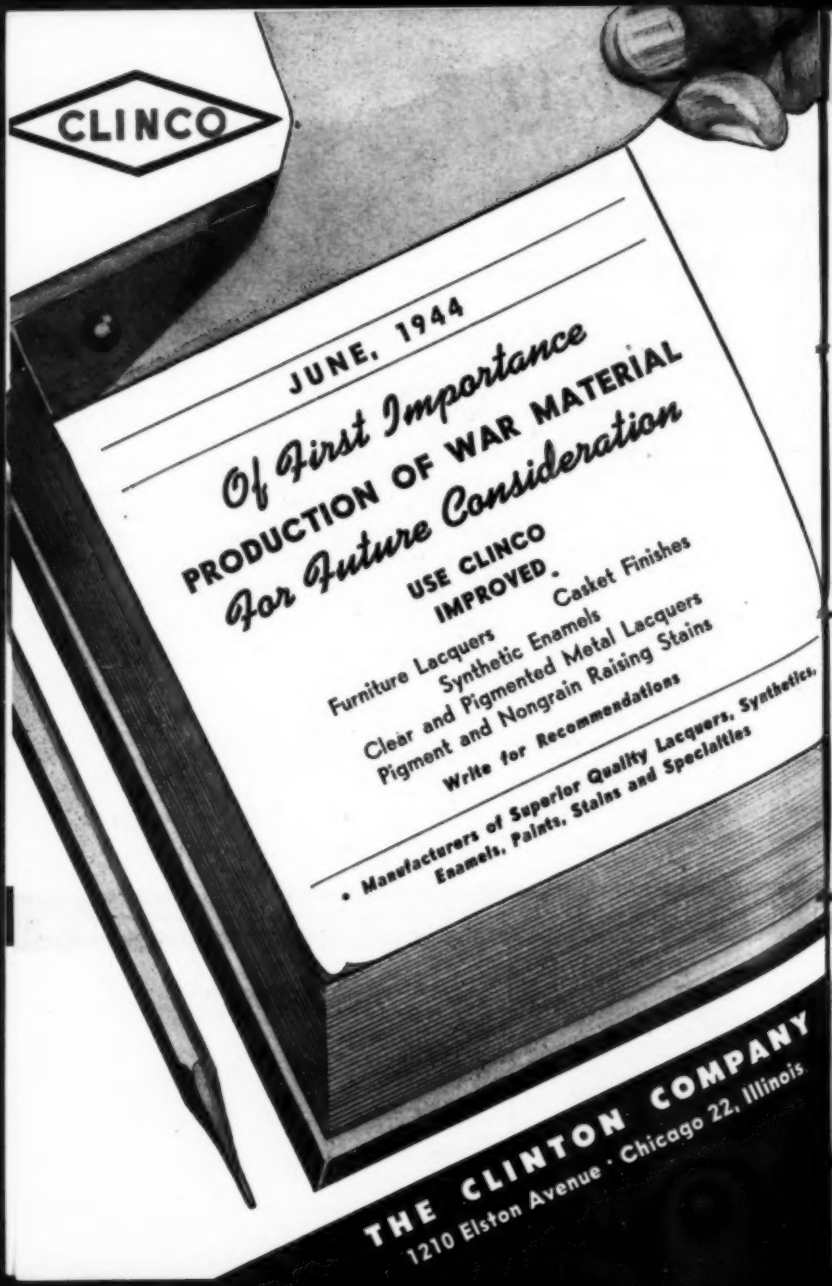
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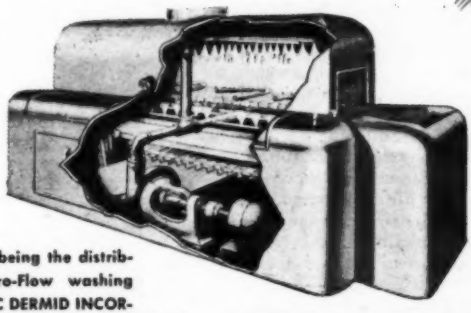

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you get to the floor grate with your spraying, the greater is the suction and the more effective the exhaust.

We Must Compensate for Spraying Outside Wind Tunnel

From this descriptive picture you can readily understand that with a down-draft floor-type exhaust, we must compensate in some way for the lack of walls around the spraying area in order to obtain the necessary air suction above the floor grate of the booth. We can control air currents within the dimensional limits of four sides of a tunnel or spray booth, which in this case is at and below floor level, but above the floor (outside the tunnel) we have no method of calculation, as we have no dimensions other than the wide expanse of the room.

A choice of two methods is offered to compensate for this weaker air suction high above the grates of a down-draft spray booth. One is to build side walls extending up from the floor around the grate. The other is to increase the velocity of air movement at floor level by increasing the capacity of our exhaust fans.

In order to control the movement of air within the limits of a factory, we must confine it to a specific area. Suppose we build four walls (say 6-ft. or 8-ft. high) straight up from the edges of the floor grate of our down-draft booth, so the air must move over the tops of these walls. These side walls increase the length of our wind tunnel, or the depth of our spray booth. They afford a means of maintaining strong air suction high above the floor grates — but probably the four walls wouldn't be exactly practical for obvious reasons. We might erect three walls, which would allow the air

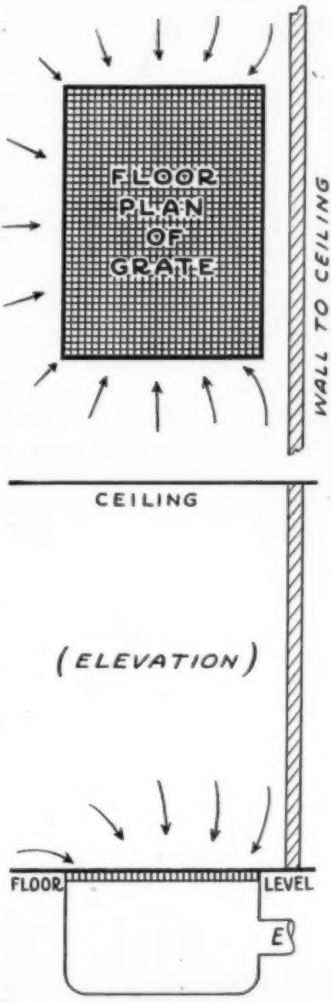
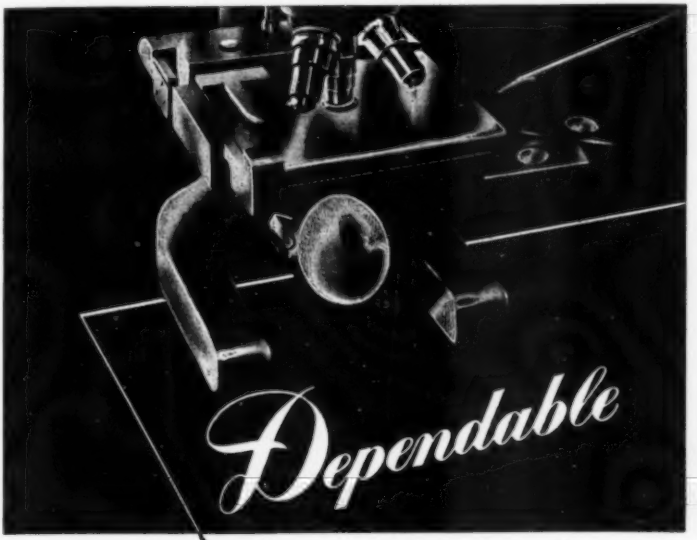


FIG. 4

Fig. 4—Floor plan and elevation of down-draft booth placed near side wall of building. This arrangement affords better suction of air above the floor grates than when there is no wall near, as in Fig. 3.



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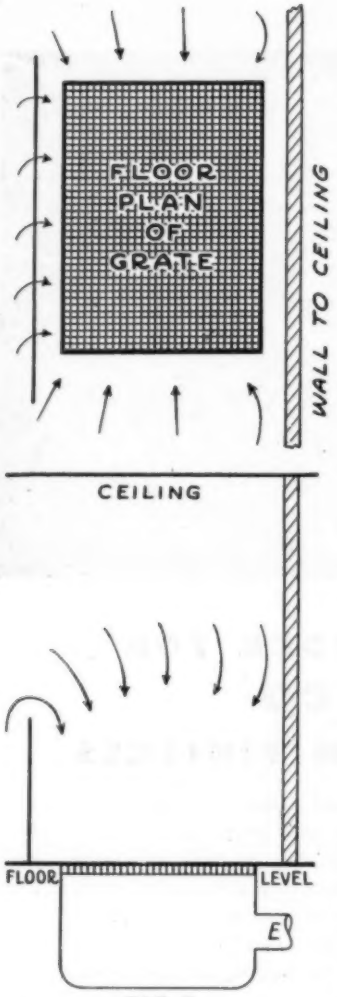

FIG. 5

Fig. 5—Floor plan and elevation of down-draft spray booth wherein an outside wall and an added portable panel help to channel and intensify the air flow in a vertical down-draft stream of air high above the floor grates. Two sides (or ends) are left open to permit the entrance and exit of products to be sprayed.

to come in over the tops of three sides and in through one open side. One of these walls could be the wall of the room or building.

Two Parallel Walls at Sides of Floor Grates

Another arrangement, which is more practical and convenient for getting work into the booth at one end and out at the opposite end, as in a continuous progressive movement of products by conveyor or otherwise, is to put up two parallel walls on opposite sides of the floor grate. This will force the air to come in at the two open ends and over the tops of one or both walls (both walls if neither wall reaches to the ceiling).

From the facts just stated, it is obvious that the location of the spraying area in a room is an important factor in making plans for a down-draft booth that will produce satisfactory results. The most difficult location is in the center of a large room. When this location is necessary, or when it is demanded for some reason, consideration must be given to all doors, windows and other openings; when they are open and closed; the prevailing winds; drafts created by blowers, fans, and ventilated areas. Each of these factors exercises more or less influence on the movement of air (or air currents) within the building. Some of these air currents may cause a drifting of paint particles and paint fumes away from the spraying area, as at short distances above the floor grate the rate of air movement (by suction of exhaust fans) is quite low.

Grate Area; Exhaust Problems

The grate area over a down-draft booth may be large or small, depending upon the size and position of the parts or products to

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be sprayed. This detail requires thought, because some parts to be sprayed may be placed directly on the grate, while others may be supported as much as 30-in. above the floor; or part of the product may extend to as much as 15-ft. to 20-ft. above the grated area. These factors must be taken into consideration when an engineer is figuring the size and shape of the grated area, as well as its location and the volume of exhaust air required.

If the steel grate is to extend more than 10-ft. or 12-ft. across the floor, the problem of increased exhaust and adequate distribution arises. This may be solved by providing a deeper pit, adding special duct work, or putting in a divided pit with two or more exhaust outlets. The deeper pit is not as practical as the divided pit with the added exhaust outlet, and it is much more practical than to put in special duct work to force the exhaust air out. If a single exhaust duct were to be as long as 30-ft., it would be better to divide it into three 10-ft. sections, each with its own exhaust fan and stack—this in order to obtain a good average velocity through the floor grates.

Weight to Be Supported by Floor Grate

Consideration of total weight and point-contact weight is important too. The steel grate must be properly designed, built and supported to hold the load over the pit. The heaviest job I know of was a 12x12-ft. grating area made to support 50 tons of total weight, and 4½ tons over a single 12-in. square of this area.

Down-draft floor-type booths can be made to operate with either dry exhaust air or water-washed exhaust air. The water-washing equipment may be installed entirely under the floor, or it may be installed above the floor.

When it is not permissible or advisable to place duct work above the floor, the ducts can be installed under ground and extended through the outside wall and then up beyond the roof, or they can end just outside the wall if the booth is water-washed. As you can see, this type of installation lends itself to ground floors only, because of its depth.

Spray booth exhaust problems should not be guessed at. Every installation is a separate problem

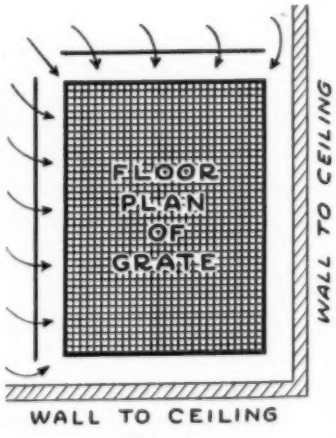

FIG. 6

Fig. 6—Plan view of a down-draft booth located in a corner of room close to two walls that join at 90° angle. If the size or nature of the work permits, portable panels (low walls) can be added on the other two sides, leaving openings only large enough for entrance and exit of the operator and whatever he is spraying. This will improve the vertical down-flow of air high above the floor grates.

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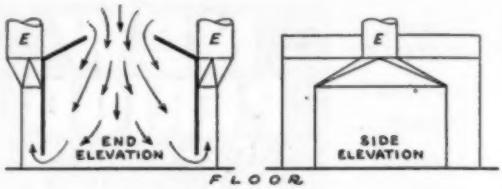

Fig. 7—Here is one type of down-draft spray booth that is entirely above the floor. The exhaust passes through openings in the sides, at and just above floor level, then upward through exhaust pipes, EE.

which should be carefully analyzed and planned to obtain efficiency and satisfaction. The depth required depends upon the size, but in general, a down-draft booth of average size should be 5-ft. to 7-ft. deep at the deepest point. Note: The actual design of under-floor down-draft booths is different from what is shown in the simple drawings that accompany this article.

For those interested I will state that while the down-draft principle probably offers about the best method of exhausting heavier-than-air particles of paint, it is not the cheapest. If the arrangement is such that the exhaust must pass through grates in the floor, which is generally the case, the installation will require a hole through the concrete floor, concrete form work, steel work, steel grating and deck plate. All of this calls for careful engineering to obtain satisfactory results.

Down-draft with Everything Above Floor

It is possible to have a down-draft spray booth with all equipment above the floor. Openings to the exhaust ducts will be at floor level, preferably on two opposite sides of the booth—perhaps on three sides if the booth has three sides. Front and side elevations of a typical spray booth of this type are shown in Fig. 7. This booth provides a down-draft, yet it is entirely above the floor. It can be moved or altered to accommodate changing conditions.

There are several variations in down-draft floor-type exhaust. It can be made square, rectangular, or it may consist of narrow ducts around the area. The ducts can be on either side of the area, or there can be a single duct along a partition or wall. Each arrangement is suited for a special purpose and type of work. Many very large and elaborate down-draft spray booths have been designed and placed in successful operation.

How to Select Color

Are you interested in how to use colors effectively on packages, so they will be favorably received by the buying masses? And what applies to packages applies also, to more or less extent, to many other products. A general survey of opinion on this subject of color, by America's leading package designers, is contained in a 12-page booklet recently published by Eagle Printing Ink Co., Division of General Printing Ink Corp., 100 Sixth Ave., N. Y. 13, N. Y. Copies are free.

Booklet on Production "Cut-Backs"

A 40-page booklet entitled, "Adjustment of Production Cut-backs," has been prepared by the Army Service Forces. Its purpose is to outline, simply and graphically, the careful consideration and detailed planning that the Army accords to any necessary reduction in production programs and resultant cancellation of contracts. Copies can be obtained from the War Department, Bureau of Public Relations, Washington, D. C.

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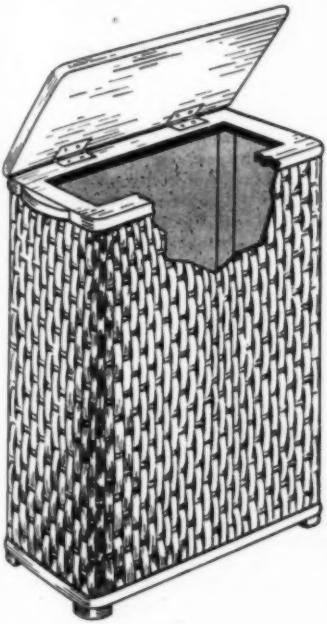

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Product Paint Troubles

AND HOW TO PREVENT MANY OF THEM

BY H. H. MILLER

AT THE risk of appearing prejudiced I make bold to offer the statement that no single raw material is capable of causing as much trouble in a plant as the paint used on the products manufactured. This is especially true when the purchase, storage, dispensing and use of the paints are not all carefully controlled.

Several glaring examples of headaches caused by lack of such control have convinced me of the truth of the above statement. As an example of what lack of purchasing control can do, let us consider the case of a certain large consumer of paint materials. For two years this company bought and used a paint which was designed for spraying, but during that entire two year's time every gallon of this spraying paint was applied by brushing. You men who know anything about paints can readily appreciate the difficulties of application, poor appearance, and non-uniformity of finish that resulted from such practice.

Why Spray Paint Was Used for Brushing

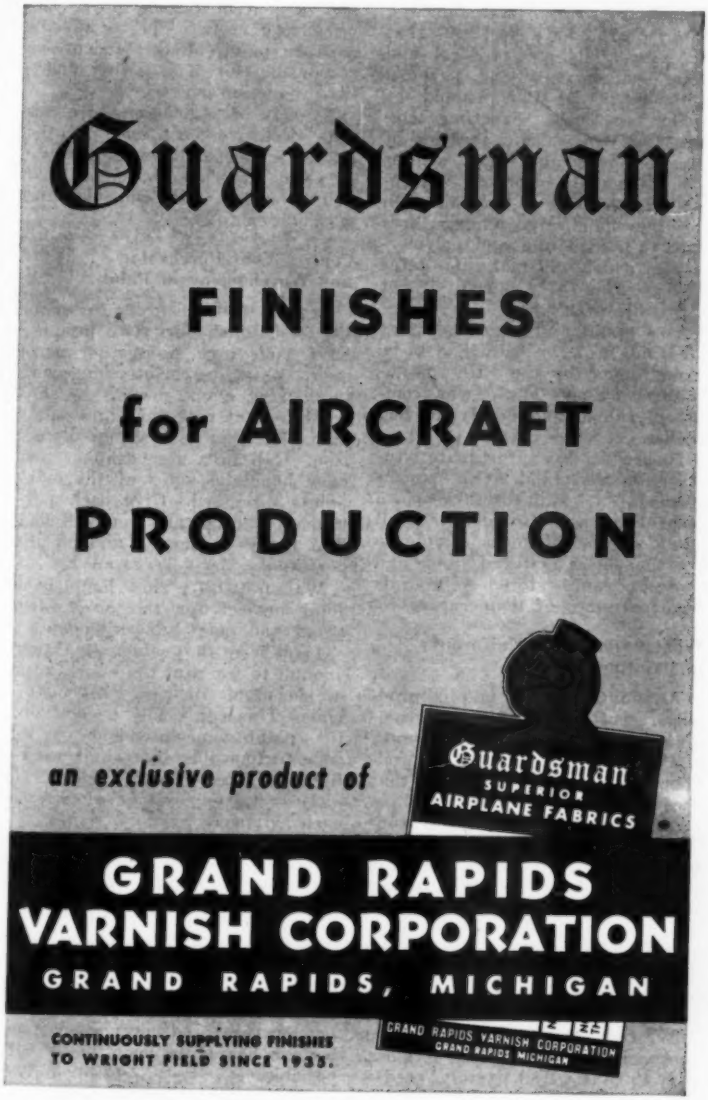
That such a condition could prevail today seems slightly ridiculous, but when you look into the background, the explanation is rather simple and plausible. At the time the paint was originally purchased, a new and enterprising production manager was on the job. He had decided to change the method of paint application from brushing to spraying. However, before the change could be made, this live-wire manager had departed for greener pastures, so brushing continued.

An occurrence of this kind, as just cited, can be prevented by establishing and continuing a program of frequent conferences attended by the paint superintendent, production manager, purchasing agent and paint salesman. I believe that monthly meetings of this kind are really essential, as few weeks will elapse without some difficulty requiring a get-together by this group.

Excess Paint Inventory Stored in Open Shed

The storage or warehousing of paints and finishing materials is of genuine importance. A recent example of improper methods of storage showed that about 90 drums of the same kind of paint were in stock at a user's plant. Material was on hand from shipments that had been received during the previous 13 months. Worse, the drums of paint had all been stored in an open shed, subject to all of the seasonal temperature changes that occur north of the Ohio river.

Now, aside from any adverse effects produced by this useless aging of the material, and the unnecessary temperature changes of from well below zero to perhaps 100° F., economically this kind of practice is unsound. Obviously an excess of paint was in stock, and it was not in the best of condition—and a considerable amount of money was tied up in useless excess inventory. *(Page 78)*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GRAND RAPIDS, MICHIGAN
CONTINUOUSLY SUPPLYING FINISHES
TO WRIGHT FIELD SINCE 1935.
GRAND RAPIDS VARNISH CORPORATION
GRAND RAPIDS MICHIGAN

Users of paints and finishing materials should understand that these materials are physical and mechanical mixtures of chemical compounds, and they should be treated as such. Freezing temperatures can cause separation of certain ingredients, which will be difficult to again incorporate homogenously throughout the paint. On the other hand, high temperatures can cause oxidation and polymerization, which will make the paint so viscous as to be difficult if not impossible to use.

As a result of the example just cited, much of the paint had to be reconditioned by the paint manufacturer. Some of it was completely ruined and nearly all had settled out excessively.

To prevent an unfortunate situation of this kind, it is recommended that paint users keep an accurate perpetual inventory of all paint stocks. Make it a rule to use the oldest material first; and protect your stored materials from extremes of temperature.

What Caused Non-Uniformity in Painting Jobs

A manufacturer of painted products recently received several complaints about lack of uniformity in the gloss and finish on his products. Investigation showed that the paint superintendent had so streamlined his job that it consisted solely of handing out to each painter, morning and noon, enough paint to last half a day, together with all the thinner the painter asked for. Each painter then thinned his paint according to the dictates of his conscience and to suit his own idea or whim of the moment. Some of it was thinned 10%, some 25%, and some even more. Result, all degrees of gloss, film thickness and drying speed—and in general a sorry mess. The remedy, of course, is to have a capable paint superintendent or responsible foreman, acting under the production manager.

By way of suggestion, to eliminate and overcome most of the difficulties encountered in the use of paint materials, I suggest that you consider this sensible and workable plan:

Control Your Purchasing and Warehousing of Paint

PURCHASING: In order to secure the best finish for your product, have your own production manager, paint superintendent and purchasing agent discuss the finish you want with the paint salesman. Let this be a group discussion. Call in a stenographer and have her take notes of the main points discussed. Give each participant a copy, and you will find that many arguments and misunderstandings will be avoided.

WAREHOUSING: This should be a joint project for the purchasing agent and paint superintendent.

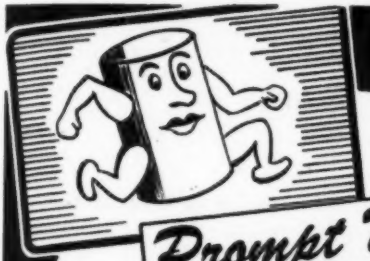
1) Where the volume is large enough to warrant the effort, keep a perpetual inventory of materials. This can easily be done by the paint superintendent or by some responsible individual working under his orders.

2) Install a system of dating each shipment received.

3) Arrange for the paint superintendent to requisition paint as needed to keep his inventory at its predetermined level.

4) Store paint products where they will be protected from the elements and extreme temperature changes. Never allow your paint to become chilled to a freezing temperature; and never allow it to become heated to over 90° F., if possible.

(To page 80)



Prompt Deliveries!

CONSISTENTLY MAINTAINED!

SANCO

AMMUNITION CASE STAIN

Stain Preservative, U. S. Army

Specification 3-190

No waiting . . . no delay in rushing jobs through to completion. Sanco Stains, preferred by top-ranking Army contractors, are shipped promptly. As much as possible, we attempt to maintain same-day shipping service!

Sanco

We manufacture a most complete line of protective coatings for all applications . . . made in conformance with United States Army and Navy Specifications . . . Write for details!

The Monroe Sander Corporation

10-18 46th Avenue Long Island City 1, N. Y.

5) Arrange for the up-ending of drums every 30 days when they are stored on end, or for rolling them half a turn when they are stored horizontally.

6) Use the oldest stock first.

A simple and efficient storage arrangement will include angle-iron racks on which paint drums can be stored horizontally in two, three or more tiers. New shipments are rolled on racks from one end and paint to be used is taken off at the other end. Receiving dates can be marked along one edge of the drum head; then the paint drums can be stored with dates in "up" position for a given period; then reversed so the dates are in "down" position.

Dispensing Materials to Your Product Painters

DISPENSING: Have one individual responsible for this job. If the volume handled is large enough to warrant the salary of a paint superintendent, he is the logical person to assume this responsibility. Otherwise, appoint some responsible individual to the task. Following are the main points of importance:

1) Arrange for suitable methods of agitating paint before dispensing it to the painters. This can be done either in the original drums or by dumping the entire contents of one or more drums into a container that has a suitable agitator.

2) The paint should be mixed, thinned and otherwise prepared in accordance with the manufacturer's directions. It is well to have established viscosities and specific gravities to which the paint must conform before it is given to the painters as ready for use.

Manufacturers who use paint materials will be pleasantly surprised to see how many of the paint troubles hitherto thought unavoidable can be prevented by the use of the plan herein described. They will find too that, after a reasonable trial period, their paint costs will decrease.

Vreeland Now G.M. of Voltax

The Voltax Co., Inc. (paints, enamels, varnishes), Bridgeport, Conn., announces the appointment of Milton T. Vreeland as General Manager of the organization. Mr. Vreeland was formerly associated with concerns in Brooklyn and Cleveland as industrial representative in Connecticut and western Massachusetts territories.

L. Camel Appointed Detrex Alkali Sales Manager

Mr. Leroy Camel, Cleveland, Ohio, has been promoted to Sales Manager of the Alkali Division of Detrex Corp., Detroit 27, Mich. Mr. Camel was previously manager of the Eastern section of the Alkali Division with offices in Cleveland, Ohio.

The continued expansion of business in this division has brought about the necessity for a larger sales organization. Mr. Camel brings to his new headquarters in Detroit wide field, laboratory, sales and service experience in the cleaning industry.

Mr. Leroy Camel, formerly Manager of the Eastern Section for Detrex Corp., now becomes Sales Manager of Alkali Division at Detroit.

The promotions of Joel Cooper, Detroit, and Herman Grosser, Cleveland, as Division Managers in their respective territories were also announced.

In addition to a complete line of Triad alkali and emulsion cleaners, strippers and spray booth compounds, Detrex Corp. manufactures alkali washers, solvent degreasers and Perm-A-Clor and Triad degreasing solvents.

Alertness to trends

• The war's demand for faster production schedules has set in motion *industrial trends* with profound postwar significance.

Because Glidden's research staff has made a habit of *alertness to industrial trends*, we have solved hundreds of individual wartime finishing problems. For instance, a recent development has reduced finishing time in one industry from 48 hours to 5 hours.

Glidden chemists are famous for their constant search for new and better raw materials . . . for their ability to meet the manifold requirements of every type of finish, methods of application and drying requirements—from fast air dry to fast infra-red baking.

You are invited to make use of Glidden facilities to meet your current and postwar finishing needs. Just drop us a line.

THE GLIDDEN COMPANY
CLEVELAND 2, OHIO

TIME-TESTED

TWO NEW NON-CRITICAL WOOD FINISHES

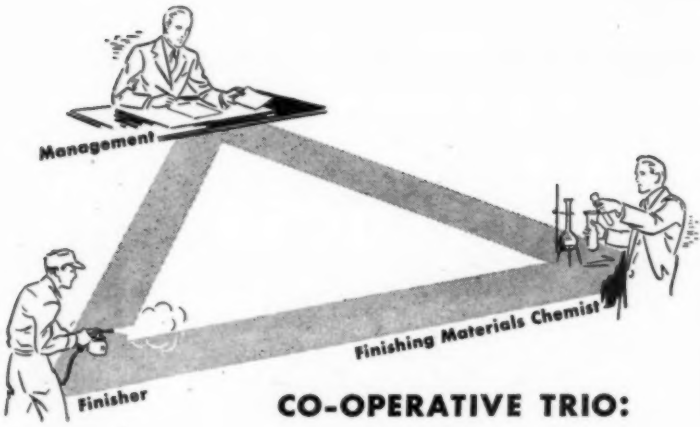
The following two Glidden wood finishes made from currently non-critical raw materials are now available:

No. 44 RUBBING AND POLISHING VARNISH.

No. 45 FLAT VARNISH

These finishes fill a real need for those who have no priority or end use that will procure critical materials.

GLIDDEN *Pacemaker in Paints*



CO-OPERATIVE TRIO:

Management, Finisher, Chemist

By R. M. KOCH, President
Standard Industrial Products

JUST as war brings together men from all stations in life—forces them to eat together, sleep together, and fight as a single cohesive unit—so the tightened demands on the industrial army have helped in bringing about much the same result in business.

While before the war men in industry, from bench hand to corporation head, were becoming more conscious of the value of cooperation, the wartime speed-up has accented and accelerated the process. Each individual realizes more than ever that his own part, however small or large it may be, is an important one—that his usefulness (and ultimate personal profit) can be greatly increased by working very closely with others up and down the line.

In the modern finishing department this cooperative effort assumes a 3-cornered aspect, and may be diagrammed as a triangle. At one point is the finisher, the man who has charge of the application of various finishes to the products passing through his department. At another corner we find the supplier, or finishing materials chemist, who, besides supplying the proper stains, fillers, sealers, paints, lacquers and other finishes, must also furnish the technical knowledge to adapt his products to the specific use of the finisher. At the apex of the triangle is management, whose important task is to see that the business as a whole is operated on a profitable basis. Each of the three is of vital importance to the success of all; any two are incomplete by themselves.

As almost everyone knows, the finishing trade, profession or business has its roots in the dim past. Men were mixing colors and decorating various objects long before historians came on the scene to

. . . that is what you have tried to achieve in your product, in addition to utility. For you know that a product must be attractive to catch the eye of prospective buyers. The final touch that will lend the desired air of distinction to your product is a special finish designed just for you by our Creative Studio. If your production is at present limited to war work, investigate our line of protective coatings. They meet all U. S. Government requirements.

Your inquiry will receive our prompt attention.

No Tampering with Quality

ROCKFORD VARNISH *Company*
ROCKFORD, ILLINOIS

Manufacturers of Protective and Decorative Coatings

WAR CARGO CARRIERS

As the tire revolves, this Seiberling gunner sprays on a rubber preservative. Fast, simple, efficient.

TO advance the day of Victory demands faster movement of war materials. And here are two of the many ways "cargo carriers" are speeded to the warpaths with the help of DeVilbiss Spray Equipment.

The spray-painting of Commando cargo planes has been "revved up" by the DeVilbiss Water-Wash, Filtered-Air Spray

These views reveal two of the many advantages of specifying DeVilbiss. One shows the ability of DeVilbiss to develop improved spray systems for special needs—the other is an example of how DeVilbiss Equipment successfully meets the changing demands of improved production processes.

Spray equipment will speed your war work, too. Ask a DeVilbiss man for his recommendation to improve today's operations and prepare you for better peacetime finishing.

THE DEVILBISS COMPANY, TOLEDO 1, OHIO

Canadian Plant: WINDSOR, ONTARIO

DeV

record their activities. Indeed, without a knowledge of differing ancient decorative modes and styles, archaeologists and historians might find it much more difficult to piece together the story of mankind.

So through the ages the finisher has been an artist, an individualist, and at the same time an intensely practical mechanic. In many cases he inherited and acquired much of his skill from father and grandfather, who were artisans in their time. He has been the instigator of most of the new finishing schemes, and many a thriving business is founded on his innovations.

Modern productive systems have not destroyed the individuality of the finisher; on the contrary, through specialization his position and importance have been strengthened.

Finishing Materials Chemist Has Become Highly Important

In former times the finisher was his own chemist. He mixed his own materials and applied them himself by hand. But the growth of the finishing industry, in keeping pace with other lines of business, has induced the finisher to focus his knowledge and skill on methods of application and treatment. With various spraying, dipping, baking and other processes to invent or master, almost countless combinations and sequences of coatings to experiment with, and a constantly-growing list of materials from which to choose, his importance as an artist—an innovator—and as practical craftsman, has grown enormously.

It was natural, then that the finishing materials chemist should acquire an important place because of the complexity of processes on one hand and the constant increase in variety of raw materials on the other. Drawing on all the resources of chemical wizardry and laboratory equipment, the chemist has been able to increase the effectiveness of the finisher's artistry and practical knowledge of application methods, by supplying him with a constant flow of newer and more workable materials. To the chemist also belongs the important task of so combining his materials and adapting his processes that they will fit into the individual finishing scheme of the finisher with whom he is working.

It has also become one of the chemist's important functions to supply the finisher with technical information he needs—information which, under modern conditions, he has no time or opportunity to acquire in any other way. Combining this technical information with his own practical knowledge, the finisher is able to secure increased production with fewer rejects and, as a final result of improvement in quality, greater customer satisfaction.

Management's Function Is to Make Their Work Profitable

Management having its primary concern with the ultimate of all business — profits — realizes that the finishing department is yet, and probably always will be, highly individual in character. Indeed, managment realizes that in order to have its product clearly identified in the minds of its prospects, it needs individuality in the finishing room. For this reason no two sets of finishing conditions are exactly alike, and because identical finishes will react differently under varying conditions, management must supply the finisher with

QUALASOLE

America's finest Padding lacquer

The Gem of Lacquer Finishes

"The Finish of Your Lacquer Problem"

QUALATONE PRODUCTS, INC.

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the best materials obtainable, developed and combined to meet the *individual requirements of his plant product and processes.*

So in the final analysis, management relies on a good finisher and, with the help of the chemist, equips him with the specific materials he requires for the individual finishing scheme or schemes in use or to be developed.

It is only through the close and active cooperation of all three that the finishing department can be operated most economically, at highest efficiency, and with the final resulting customer satisfaction upon which the future of the business depends.

Stencils for Marking Shipments

BY JEROME M. BIALOSKY

THE USE of stencils for marking shipments and ordnance material is quite widespread. Cut-paper stencils are suitable where only a limited number of items are to be marked; they are cheap and readily available in the shipping department of most companies. Paper stencils, however, are subject to softening, tearing and fraying when cleaned with solvents.

Sheet metal stencils are recommended where a large number of pieces are to be marked. These stencils will withstand repeated cleaning and, with care, will give excellent service. Metal stencils cannot be cut on the usual stencil cutting machines, but they can be purchased from stamp manufacturing companies. Although the initial cost is high, the long satisfactory service given will justify their use.

FIG. 1

Fig. 1—Long narrow stencils need a handle or hand grip at each end.

FIG. 2

Fig. 2—Small stencils can be framed to hold them flat; the frame will serve as a shield for overspray.

Where long stencils are used, it is a good plan to tack wooden handles to the ends, as shown in Fig. 1. These will help position the stencil and maintain contact with the surface to give a sharp print.

Where small stencils are used, a box type frame can be made,

FIG. 3

Fig. 3—A stencil frame made to fit a cylindrical or curved surface.

A.C. HORN PRODUCTS
1897–1944

HORN INDUSTRIAL FINISHES
are
"BUILT TO ORDER"

Everyone knows that the cost of finishing is many times the cost of the finishing product. HORN advice concerning finishing methods costs you nothing—it may save you much!

HORN INDUSTRIAL FINISHES are custom built—built for the most economical method on your equipment. For 47 years HORN has been a pioneer in the invention of methods—and in providing dependable finishing products.

The Horn Policy

"Produce for our customer the finest finishing product for his purpose at the lowest possible cost to him."— A C Horn

Interested manufacturers are invited to enjoy the advantages provided through this experience and trained personnel, available on inquiry—address

A. C. HORN COMPANY
PRODUCTS FINISHING DIVISION
LONG ISLAND CITY 1, NEW YORK

CHICAGO • HOUSTON • LOS ANGELES

using the stencil as the bottom, as shown in Fig. 2. The sides should be about 2-in. high and will act as overspray masks.

In the case of cylindrical objects to be stenciled, a variation of the square frame can be used, see Fig. 3. In this case two opposite sides of the box are cut segment-shaped to fit the cylinder or drum to be marked.

If stenciled letters or designs are applied with a spray gun, the top surface of the stencils may be covered with a very thin film of grease. This will prevent the ink or paint from adhering to the stencil, and will reduce time and effort required to clean the stencils.

Mrs. Donahue President of Donahue Varnish Co.

At the annual meeting of The F. J. Donahue Varnish Co., Detroit 13, Mich., Mrs. F. J. Donahue was elected to the Presidency of the company. Having been one of the founders of the business, Mrs. Donahue has been active in the affairs of the company, serving first as its Secretary-Treasurer, and now as its President. In her new capacity Mrs. Donahue will be even more active in the formulation and execution of the policies of the company.

Arco Co.'s Ten-Year Club

With 123 of its 239 Cleveland employees now in its "Ten-Year Club," The Arco Co., Cleveland paint manufacturer, recently celebrated the achievement of "veteran" status by more than 50% of its personnel.

Three 25-year "veterans" received diamond studded service pins at the annual club dinner at Hotel Statler. They brought the total number of 25-year men to 19. Those present totalled 2014 years of service, and averaged 16 years with the company.

Ten-year pins were presented to 16 employees, including K. N. Kathju.

Howard E. Wise, president of the company, presented the pins and read special messages to the group from 13 members of the "Ten-Year Club" now in uniform. Salesmen from 18 states were guests at the dinner.

Materials Supplies Equipment

Camouflage Enamel for Food Cans

Milk cans, or other packed cans which must be coated with camouflage enamel, will meet the finishing requirements of Army Spec. No. CQD 200A when properly finished with A&W No. 471-15 Camouflage Enamel.

This new, government-approved finish, which protects food cans from corrosion and prevents visibility from the air, may be applied either by spraying or by dipping. It air-dries in 8 to 10 minutes; and if air, heated to approximately 175°F., is caused to flow over the cans as they come out of the dip tank or spray booth, the paint drying time is cut to from three to five minutes.

An additional feature of A&W No. 471-15 Camouflage Enamel is its excellent adhesion. It will not chip off and fall into the contents when the can is opened. A product of Ault & Wiborg Division of Interchemical Corp., 350 Fifth Ave., N. Y. 1, N. Y.

Paint Resists 90% of the Known Corrosives

Tygon paint possesses the basic corrosion-resistant characteristics of the parent Tygon—the amazing synthetic, rubber-like material used in the manufacture and handling of innumerable corrosive agents. Tygon paint is pure Tygon, liquefied by the addition of solvents, which on evaporation leave

Hardwood Finishing Headquarters

SINCE 1888

GLOVES

RUBBER	1 Doz.	½ Doz.	Each
QUACKER No. 10	1 Doz.	½ Doz.	Each
SYNTHETIC	1 Doz.	½ Doz.	Each

GLUE

SHEET CABINET

No. 36 Brazilian South American Hide	Bag	25 Lbs.	10 Lbs.	Lb.
No. 22 U. S. A. Domestic	Bag	25 Lbs.	10 Lbs.	Lb.
No. 19 Domestic Rabbit Skin	Bag	25 Lbs.	10 Lbs.	Lb.
No. 5 Gelatine	Bag	25 Lbs.	10 Lbs.	Lb.

GLUE

LIQUID

Savloid Transparent	Bbl.	5 Gal.	1 Gal.	1 Qt.	1 Pt.
Savloid White	Bbl.	5 Gal.	1 Gal.	1 Qt.	1 Pt.

INK

MARKING
(Black, Red, Blue) ..... Gal.

STENCIL
(In Cakes, 3"-4" Diameter) ..... Each

JAPAN COLORS

All Colors ..... 5 Lb. Press Can ..... 1 Lb. Can
Ask for Color Card.

Illustrated catalogue of complete finishing materials that will take care of your finishing requirements.

H. Behlen & Bro., Inc., 10 Christopher St., N. Y. C. 14

a sturdy, durable film of chemically unchanged Tygon.

Tygon paint is used to protect wood, metal or concrete from the attack of corrosive fumes, condensates, occasional spillage, or from exposure to moisture, oils, sunlight, air or other oxidizing elements. It shows no tendency to crack, craze, check or "weather," even after long exposure; is unaffected by water, fresh or salt (continuous exposure for more than 1000 hours in salt spray tests showed no effect); possesses high dielectric strength, of importance where electrolysis is present.

Tygon paint films are flexible. They neither become brittle at temperatures well below zero, nor soften at temperatures as high as 150°F.

Tygon paint may be applied by spray, brush, dipping or roller-coating to wood, concrete or metal surfaces. May be air-dried or baked. Formulations include black, white, clear and a wide range of colors. A product of U. S. Stoneware Co., Akron, Ohio.

New Export Emblem Decal

In cooperation with the Office of War Information, The Meyercord Co., decalcomania manufacturer, Chicago 44, Ill., is releasing a full-page color

New red, white and blue official export seal.

ad to 30 trade publications during May and June featuring OWI's new Export Seal program for non-lend lease exports.

By use of the new red, white and blue official Export Seal, OWI points out, millions of non-lend lease articles now exported to foreign nations can be uniformly identified as "imported from the United States," a basis for wartime and postwar goodwill and publicity.

The seal can be used in any shape or size, in any language, separately or combined with a manufacturer's regular trademark or nameplate. While OWI does not supply the seals, their purchase being left to a source of supply of the manufacturer's choice, OWI does, however, supply translations in any language and the basic design.

Although the use of the seal is voluntary, in view of increasing country-of-origin identification competition from other foreign competitors, OWI anticipates an enthusiastic cooperation from exporting manufacturers in the United States.

To facilitate the program, The Meyercord Co. is offering to prepare decalcomania sketches of manufacturer's nameplate combined with the Export Seal where lasting identification is desired on equipment and other non-consumable goods.

Full information regarding the Export Seal program may be obtained by writing to the Special Promotion Division, Office of War Information, 250 W. 57th St., New York 19, N. Y.

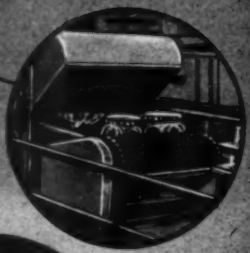
Shows Height of Contents in Closed Drums

Techtmann Industries, Inc., 828 N. Broadway, Milwaukee 2, Wisc., announces that the patented U-C Indicator has been made adaptable to 30-gallon steel drums in addition to the 55-gallon steel drums on which it has been successfully used for several years.

The U-C tells at a glance the "inside story" about the liquid level content of drums containing oil, solvents, etc. Eliminates tapping, measuring, guessing; it keeps constant check on supply of vital liquids, thus avoiding the danger of running short during war times when supplies are hard to get and deliveries are slow.

Fits all 55-gallon and 30-gallon steel drums. As easy to transfer as a fau-

WHAT'S THE BEST DRYING METHOD?



INFRA-RED RADIANT HEAT? . . . CONVECTION OVEN BAKING? . . . AIR DRYING? . . . Each, of course, has its own advantages in certain applications. Yet, regardless of your drying or application methods, M & W can usually develop a finishing formula that will be suitable both for your present equipment and the results desired. ☆ Manufacturers of war and industrial materials are invited to consult our staff of technicians for recommendations and samples, without obligation. ☆ Write for our booklet, "Information on U. S. Government Specification Finishes," containing up-to-the-minute lists of specifications and the M & W finishes which meet them.

M & W

MAAS & WALDSTEIN COMPANY, NEWARK, N. J.

PRODUCERS OF LACQUERS, ENAMELS, SYNTHETICS AND SPECIALTY FINISHES FOR ALL PURPOSES

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cet. You merely screw the U-C Indicator into the drum faucet opening; then screw the faucet into the opening on the indicator body. When the drum is empty, you remove the entire assembly and attach to a full drum.

Cleans Aluminum Surfaces

A new method for rendering aluminum surfaces chemically and metallurgically clean in preparation for spot welding, is announced by Turco Products, Inc. of Los Angeles and Chicago. Turco-Vulco Etch is a chemical bath which frees aluminum alloy surfaces of oxides, corrosive salts, and tenacious grease and oil films.

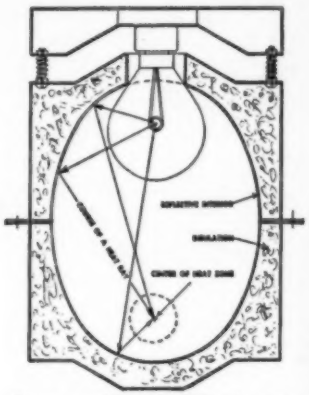
Vulco-Etch lays the foundation for sound spot welding by assuring a chemically and metallurgically clean surface. Cleaning and etching are accomplished in a 5 to 20-minute dip in the Vulco-Etch solution. Unheated wood-lined, rubber-lined or crockery tanks are used. The material rinses freely in fresh, cooling water. The solution is long-lived, and may be used for months without change.

Infra-Red Oven Has Elliptical Shape

Infra-Red Engineers & Designers, 1633 E. Fortieth St., Cleveland, Ohio, have developed and patented a sectional infra-red oven that has an interior cross section of elliptical shape, as shown in the accompanying drawing. Quoting from the company literature:

"Heat from the lamp filaments just 'billiards' against the highly reflective interior insulated wall to the heat zone located along the opposite side of the oven. All the heat rays are concentrated in an imaginary 'pipe' or heat zone about 2-in. in diameter. The operation of the elliptical oven is based upon the theory of an ellipse which has two centers or foci. The lamps are placed in one of these and the work in the other.

"Inside size of the standard unit is 9x12-in. and 250-watt lamps are used.



Cross section of elliptical oven.

The oven is designed in two halves which may be separated.

"Depending upon the time and speed, a number of units may make up an oven through which a conveyor may pass in the neutral portion of the oven. Parts may come from an automatic dip, in which case the lamps will be above the conveyor and the heat zone below. Again, by reversing the oven and having the lamps below, the parts may pass through on upright pins, after being sprayed automatically, for instance."

Aircraft Engine Finish

The Lacquer & Chemical Corp., Brooklyn 32, N. Y., manufactures and supplies a specially tailored clear protective lacquer for the engines of aircraft that fly a 4-continent route. These aircraft engines are subject to over-water flying and run into everything from tropical rains to hailstones, consequently the finish must be able to stand up against about everything in the book, including high octane gas and lubricating oils. Even rain drops coming at 215 miles per hour would almost take the skin off one's face, but hailstones coming like bullets from a battery of machine guns must not

The answer to

YOUR PROBLEM

may be in

OUR FILE

We invite you to submit your urgent or difficult finishing problems to our staff of experts for quick action.

RANDOLPH

FINISHING PRODUCTS CO.

DOPES · LACQUERS · ENAMELS

cut through the protective coating of clear lacquer, for once corrosion starts, it works insidiously at a rapid rate.

Air-dried in less than an hour, this finish was first tested by American Export Airlines for every condition to be met, such as high temperatures, abrasion, and a variety of chemicals. It had to conduct heat well, because the thermo coupler must radiate heat right through the lacquer.

Metal-Parts Cleaner

The Sturdy-Bilt Equipment Corp., West Allis (Milwaukee), Wisc., announces special small all-purpose units of their "Simplex" line of metal-parts cleaners.

The operation of the compact "Simplex" combines active soak and swishing action for positive removal of all foreign substances. Hot or cold solution may be used. The operator loads the tray with the parts to be cleaned, throws the switch and the "Simplex" does the rest.

The fully insulated welded steel tank and the few working parts, plus the all-around simplicity, contribute to the popularity of these machines.

The adaptability of the "Simplex" makes it desirable for hundreds of different uses in every kind and size of metal working factories. Uses include washing, slushing, cleansing, rinsing and dipping operations of metal parts and small assemblies, where faster production and higher quality finished products are necessary for wartime production. They can be installed singly in many different departments or in series—one unit for cleaning, another for rinsing or rust prevention coating, and others for special requirements.

Gives active soak and swishing action.

Non-Critical Degreaser

Good news to all who appreciate the advantages of clean machinery is the proven efficiency of a degreasing and cleaning medium known as "Penetone," which contains neither carbon tetrachloride nor trichlorethylene—chemicals not now available except on WPB allotment. Actually, Penetone has been found to do an excellent job.

Penetone offers complete safety both from fire hazards and injury to operators. Penetone contains nothing that is toxic, inflammable or injurious to the skin.

Penetone, as a degreaser for metals and machinery comes in two formulas: The standard Penetone is suitable for more than 80% of all applications, including all degreasing jobs where the lighter types of greases and oils are used, as well as general maintenance.

"Penetone Senior," a stronger concentrate, is recommended for use on heavy oils and caked-on greases.

The formulation of Penetone is such that by rapid emulsification and the ability to decrease surface tension, oil, grease and the adhering dirt are quickly loosened and removed.

Penetone exerts a mild inhibiting action on the metal surfaces, which while not always suited for permanent needs, is sometimes useful while materials are in process to retard corrosive effects.

Still another Penetone Product is known as "Major," which is recommended for heavy duty degreasing, requiring an extremely potent preparation. This concentrate is combined in the ratio of one to seven with kerosene for certain purposes; in the

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Complete—All-inclusive—Handy
Everything to Make Repairs

Packaged neatly and compactly in DeLuxe Metal carrying cases, each Porcelkit and Lubri-Paque Kit, pictured at right, contains more than 100 items which make them the most complete and serviceable kits on the market. Everything needed for both wood and metal finish repair included in the kits—not an item omitted. Think of it! These handy cases with all usable items included right at your elbow when needed.

Here's a picture of the MASTER FINISHER'S SUPREME SERVICE FINISHING AND PORCELAIN REPAIR KITS as well as Contents

SPECIAL OFFER—SAVE $7.01

Lubri-Paque Kit, alone..... $38.50
Porcelkit, alone 18.50

Special offer this month for both Kits..... $49.99

Also Individual Repair Kits for Different Trades . . .

LUBRI-PAQUE KIT: This is the Master Finishers' Supreme Service Finishing Repair Kit. Everything the Master Finisher needs for repairing damaged finish on furniture is in this Completely Fitted Kit. Over 70 items neatly arranged in a fine new type 19x7x7" Heavy Duty, Super Steel DeLuxe Carrying Case. This kit features our Nationally Famous Lubrisol Pad-O-Paque Process, the Greatest Discovery of Modern Times for Time, Labor and Material Saving, which makes repairing damaged finishes a pleasure. Simple to use. Inexperienced help can learn to do an expert and lasting finishing job on any finish in about 10 minutes. Instead of the "Electro-Knife" pictured we will include our finest alcohol torch and pallet with these Kits.

PORCELKIT: The Master Finishers' Supreme Service Porcelain Repair Kit. Everything the Master Finisher needs for repairing porcelain. Embodies all the essential articles for porcelain repair that are found in the Lubri-Paque Kit, together with additional items for Filling, Glazing, Tinting, and Patching damaged porcelain or vitreous enamel. Over 40 items neatly arranged in the same fine DeLuxe Carrying Case as the Lubri-Paque Kit.

STANDARD FINISHERS KIT: Embodies and contains smaller amounts of the essential items found in the Lubri-Paque Kit.

MUSIC AND RADIO KITS: Each designed especially for piano, music and radio stores; includes items particularly useful to these dealers.

Write, Wire or Phone for Specific Information and Prices.
A complete line of finishes, repair materials and supplies.

FINISHINE LABORATORIES, INC.
SYRACUSE 4, NEW YORK

Our Slogan: "Thousands for Research—Without One Cent of Regret"

same ratio with water for other purposes, and again one part of the concentrate to seven of water and seven of kerosene for still other uses. Penetone is manufactured by The Penetone Co., Tenafly, N. J.

Solvents Recovery Service Opens New Plant

Due to the fact that New England industry in general has taken advantage of the opportunity of having their valuable solvents recovered in order that they may put them back to work, Solvents Recovery Service, Inc., 1019 Broad St., Newark, N. J., announces the opening of its third plant at Thomaston, Conn., in order to better serve that section of the country and relieve the congested condition of the two New Jersey plants.

The Lofgren Process will be used at this plant, as in the other two plants, and for the present the company will specialize in the recovery of solvents such as trichlorethylene and other chlorinated solvents. This plant will also handle hydrocarbons and certain higher boiling esters.

In leasing a portion of the plant previously occupied by the Seth Thomas Clock Co., provision was made for enlarging the plant in the postwar period, so that lacquer thinners, acetones, alcohols, and low-boiling esters can also be handled at the Thomaston plant.

Mr. Alfred B. Crane, who has represented the Solvents Recovery Service, Inc., in New England for the past four years, will continue in that capacity and the new plant will be under his direct supervision.

The opening of this recovery plant in Connecticut will not only result in better service for New England industry, but will allow substantial savings in transportation charges to all concerns in that section who operate metal-finishing department. All present customers whose material will be handled at this plant, have been advised to make future shipments to Thomaston.

Detrex Corp. Enlarges Branch Office Organization

To provide the most efficient customer service possible, Detrex Corp., Detroit 27, Mich., manufacturer of Detrex degreasers, Washers, Perm-A-Clor and Triad degreasing solvents and Triad alkali cleaning compounds, has enlarged two eastern sales and service offices and added another in the midwest.

The Eastern Region headquarters in New York City are now located in the Empire State Building, Suite 4113. It is under the direct supervision of Stanley A. Harris, Eastern Region Manager.

The Philadelphia branch office has been moved to 12 S. 12th St. Wayne Gaddy, Philadelphia Division Manager, is in charge of this office.

A new branch office for the Indiana territories has been opened in Indianapolis at 11 S. Meridian St. Charles M. Munns is the Division Manager in charge of this new office.

In their nation-wide coverage of sales and service for industrial cleaning equipment and materials, Detrex now has a total of 19 branch offices in major cities. Of these, 14 will handle orders, correspondence and service direct with customers and prospects. Releases for cleaning materials will be made from warehouses conveniently located in the various industrial centers covered by each of these branch offices.

Ross Engineering Corp's. President Dies

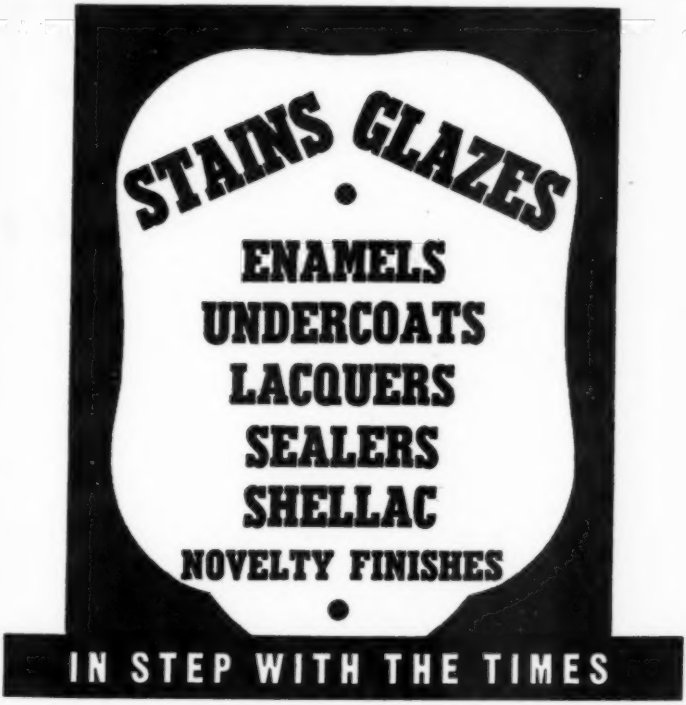
Alfred B. Clark, for many years president of J. O. Ross Engineering Corp., New York City, passed away suddenly on May 27th. Mr. Clark was stricken while in Atlantic City attending the Foundry Manufacturers' Convention. He was widely known throughout the heating, ventilating, drying and air-conditioning industries and had been associated with the J. O. Ross Engineering Corp. since 1921, when the business was founded.

Technical Sales Director of Glyco

The Glyco Products Co., Inc., Brooklyn 2, N. Y., announces the appointment of Dr. Eugene McCauliff as Technical Sales Director of the Company. Dr. McCauliff is a graduate of Fordham University where he received his Ph.D. in organic chemistry in 1931.

Dr. McCauliff has recently been engaged in consulting and advisory activities for the chemical industry, in which capacity he initiated many process developments and designed chemical pilot plant and production installations.

In his new position, Dr. McCauliff will devote his time to the technical sales development of the esters, synthetic waxes, emulsifying agents, etc., manufactured by Glyco.



Industrial Finishes

that make the most of available raw materials to give you greatest durability, together with attractive appearance and economy.

FOR APPLICATION BY ALL METHODS

JAMES B. DAY & CO., CHICAGO

"Patching" Trouble

We are having trouble in our finishing department with "French Patching." We use white shellac in patching, but this blisters when the chairs pass through our drying ovens. We patch after the sealer coat and then put on one top coat of flat varnish. The temperature of our ovens has been increased from 125° to 140°F. The humidity is 35%—U. H. Co.

I would suggest that you use a lacquer stick for patching. This will stand more heat than a shellac stick. Instead of using white shellac for "Frenching," I recommend that you try to obtain a wax-free shellac or a commercial French varnish.

If you have a high enough priority you can probably obtain the wax-free shellac from any lacquer supply house. If not, here is a suggestion that may do as well: Place a quantity of white shellac in glass jars and let it stand until the heavier part of the solution settles to the bottom. Then drain off the clear material from the top. Be careful to avoid getting any of the heavier portion that has settled. Add about one part of ether to 15 or 20 parts of your shellac solution. When using white shellac to make clear Frenching shellac, reduce the shellac down to at least a 2-lb. cut with wood alcohol, if wood alcohol is obtainable; if not, use regular alcohol.

Of course, an oven heat of 140° is quite high for finished wood furniture, but the finish should not blister unless the products are left in the oven too long.—E. HOGSTROM.

I don't understand your reason for French Patching before the last coat of finish is applied. It is customary to do this type of work after the top or final coat is dry and rubbed smooth.

French Patching is usually done to repair spots that are rubbed through in the rubbing operation, or to "French" over dents, chipped veneers, etc., after they have been filled in with stick shellac, as this saves the time and expense of removing all of the finish and refinish a whole top or end or side of a damaged piece of furniture.

I suggest that you first fill in the indenture with stick shellac. Sand this patched area (with a piece of fine sandpaper) to a level with the surrounding surface. Instead of using shellac to build up, by "French Patching," any surface sanded through (in leveling down the shellac) I believe you should use lacquer sealer. Using a small spray gun, you can spot and blend in your sealer with the rest of the surface. If some of the color is sanded off you can tint your lacquer sealer to the color of the surface to which it is to be applied. When this is dry you can sand the whole surface and then apply the top coat of varnish as usual.

I think your blistering trouble is coming from the oil which is probably used in connection with your French Patching, as most fin-

EASY APPLICATION

NITROCELLULOSE LACQUER is the preferred finish for industrial products because it is easy to apply and quick to dry. It forms a hard, durable coating which retains its good appearance through years of service.

With lacquer you can apply and ship without delay . . . an important advantage in speeding delivery schedules. You will want this advantage for tomorrow's products, as well as for today's.

Nitrocellulose Lacquer—the post-war finish on today's war-products.

CSC makes no lacquers or thinners but supplies solvents and plasticizers to manufacturers of protective coatings.

CSC

COMMERCIAL SOLVENTS

Corporation

17 East 42nd Street, New York 17, N. Y.

ishers use paraffine rubbing oil in French Patching. This retards the drying of white shellac and, of course, when it goes through the oven the heat causes it to blister.

White shellac contains a certain amount of wax and if the French Patching is done hurriedly, the thick coating you build up doesn't have time to dry. This too would cause it to blister when going through the oven. And, of course, white shellac applied in heavy coats, even if it is allowed time to dry, won't stand as much heat as ordinary lacquer sealer. This is due to the low heat resistance of shellac gum.

I think the heat and humidity of your oven are in the proper proportion to each other, but I believe the heat is too high for a heavy coating of white shellac, such as you get in French Patching.

Dewaxed shellac is better for French Patching, but it isn't possible to buy this type of shellac now —that is, so far as I know. You can take ordinary white shellac and, by using a conical-shaped paper filter, you can remove most of the wax from the shellac.—H. W. CHESTER.

Measuring Materials Used

I was particularly interested in the query, "Measuring Amount of Materials Used," which appeared on page 88 of April I.F. Faced with the desire to know how much paint was sprayed for each 55-gallon drum repainted (we reclaim and repaint steel drums) and from that to estimate the percent lost, we set our container on a scale, and weighed the added materials, paint and thinner*, checking weight as each drum was painted, and thus obtained data from which it was easy to determine the amount required per drum. By such checking, incidentally, we cut our paint consumption 40% under what we used at first.

The amount of loss was closely approximated by weighing the bare drum just before it reached the spray booth, and again as it emerged on its way through the drip alley and thence between the banks of infra-red drying lamps. Weight of paint material sprayed per drum, minus the painted drum's gain in weight, gives us the amount of paint loss.

Personally, I adopted the scale method for determining paint consumption instead of the flow-meter because the scale added nothing to be cleaned periodically, and thus kept at a minimum the number of units which, with the quick-drying synthetic we used, would have been far from accurate had a stoppage occurred of sufficient duration for the material within the meter to have changed consistency, or possibly even begun to set.

If your inquirer wants an accurate and continuous record of paint used, against which he can plot production at his leisure, any of the continuous recording scales could be used, with times on scale and production count being correlated.—ELTON STERRETT.

*Incidentally controlling thinner increments closely.

Maas & Waldstein Co. Expands

Maas & Waldstein Co., producer of industrial finishes, Newark 4, N. J., has practically doubled its present site, by purchase of an adjacent tract of land. The newly acquired land has a frontage of 245-ft. on Riverside Ave., Newark. It is served by a spur of the Erie Railroad.

Since 1875

O'BRIEN

INDUSTRIAL FINISHES

Not the Most · · Just the Best

ORIGINAL THINKING -- ORIGINAL FINISHES

NO ONE has yet found a way to record brains and intellectual curiosity, yet American industry has a way of giving the green light to the engineer who shows signs of original thinking.

Over a period of years O'Brien's have seen quite an array of talent pass through their technical force. Invariably the separator screen has retained those men who demonstrate their ability to do some original thinking.

O'Brien's believe that their success is predicated upon the success of their customers. In approaching the multiple problems which arise in any finishing operation, O'Brien's keep foremost in their minds the real question behind the job: What is good business for the customer?

Sixty-nine years of efficient operation and consistent growth speak highly for the interest which O'Brien's show in the welfare of their customers. Any concern conducting a finishing operation may depend upon some degree of irregularity arising somewhere, sometime in the endeavor. It is at such crucial stages that O'Brien's desire to serve is most clearly manifested.

When interest recently accelerated in the field of prefabrication of houses, O'Brien's traditional ability to do original thinking contributed much to the development of new, unorthodox finishes designed to perform to exact specifications on today's production lines and to dovetail with finishing programs intended for the postwar erection period.

O'Brien's L-1535 Plywood Sealer exemplifies one of the finishes widely used in house prefabrication. Its simplicity of application by spray gun, its immediate five-minute drying time, and its good sealing properties, over which any subsequent coatings stand out in all of their beauty, combine to make L-1535 Plywood Sealer an excellent finish for prefabricated houses.

We appreciate inquiries from the industrial finishing trade for more detailed data upon this and other tailor-made finishes.

O'BRIEN VARNISH CO.
South Bend 21, Indiana

Letters from I. F. Readers

(Continued from page 8)

delphia Naval Storage Depot is actually only approximately equal to the average capacity of scores of Cardox Systems.

You may be further interested in knowing that in Cardox Systems, liquid carbon dioxide is stored in a single storage unit at 0°F. and the relatively low-pressure of 300-p.s.i. Handled in this way, there is virtually no practicable limitation to the amount of carbon dioxide that may be made available, whether for the protection of one extremely large hazard or for numerous hazards. Rate of application can be engineered in accordance with the requirements of each specific hazard covered, since CO_2 as controlled and applied in such systems, has uniform extinguishing characteristics, regardless of ambient (surrounding) temperatures. In addition to reducing the oxygen content to a point below the combustion requirements, highly effective cooling is realized since carbon dioxide released at 0°F. yields 45% CO_2 "snow."

The scope and performance of such systems has, in fact, resulted in their overwhelming preference for the protection of many extremely large and severe hazards, both military and civilian.

The progress made in the engineering of carbon-dioxide fire-extinguishing systems for extremely large hazards has, within the last few years, been very rapid. It is believed, therefore, that the facts set forth in this letter will be valuable to you in the interest of future accuracy when extreme claims regarding the size of carbon-dioxide fire-extinguishing systems are advanced.—CARDOX CORP., CHICAGO.

Want Spray Booths

We are in the market for two or three spray booths for our finishing room, and wonder if you might be able to advise us some sources from whom we might be able to purchase them.—N. Mfg. Co. (Quality Kitchen Furniture).

See I. F. advertising pages.—ED.

Jet Agitators for Heating, Agitating Tank Contents

Information and illustrations about various types of steam jets for shooting steam or air into tanks to heat or agitate their contents, are contained in a 4-page bulletin printed in two colors and ready for distribution by Heil Engineering Co., 12901 Elmwood Ave., Cleveland 11, Ohio.

Booklets Catalogs Circulars

Radio Parts Catalog

The Sun Radio & Electronics Co., 212 Fulton St., New York 7, N. Y., is distributing, free of charge to authorized purchasing agents, an 800-page bound volume containing a listing of standard, nationally advertised radio parts and electronic equipment. A copy of this book will be sent without charge to plant executives who request it on their company letter-head.

New Bulletin on Waxes

Shortages of many mineral and vegetable waxes has caused manufacturers to turn increasingly to substitutes, replacements, and extenders. In order to provide a ready reference to these waxes, a new technical bulletin has just been issued, entitled, "Waxes for Today and Tomorrow."

This booklet lists 36 different kinds of waxes, together with their specifications, and current prices. It affords a ready reference for production men who may have occasion to modify their formulas or experiment with new ones.

Copies of this booklet can be obtained free upon request from Distributing & Trading Co., 444 Madison Ave., New York 22, N. Y.

Vapor Degreasing Book Free

The Phillips Mfg. Co., 3475 Touhy Ave., Chicago 45, Ill., manufacturer of cleaning solvents, and degreasing equipment, has just released a new complete Manual on Vapor Degreasing (24 pages 5½x8½-in.).

Anyone concerned with industrial solvents and degreasing in any way will find this new book a source of

Standard Scores Again!

RINKOLIN First Linseed Wrinkle

Mo-W

a new wrinkle finish

(A COMPANION TO RINKOLIN)

AVAILABLE ON LOWER PREFERENCE RATING

When tung and oiticica oil vanished Standard Varnish promptly brought out RINKOLIN, a better wrinkle finish made with linseed oil. Now, with the supply of phthalic anhydride very limited we announce a companion product made without alkyd resins; therefore, enjoying more lenient end use. The uniform dull texture is independent of baking schedules, including short infra-red bakes.

FOOLPROOF BAKE

HIGHER MILEAGE

SINCE 1870

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much valuable practical information. It is the last word on the rapidly growing field of Vapor Degreasing—an unbiased, factual presentation of the subject.

Written by a leading metal-cleaning engineer, in clear, concise question and answer form, this illustrated handbook takes up every phase of vapor degreasing including: Types of work that can be handled by vapor degreasing, recovery of solvents, toxicity, degreasing of bowl-shaped parts, proper size of degreasers, special uses for degreasers, and other problems.

Hot Wax Dipping

Based on the logical theory that the efficiency of the protective coating depends upon the wax and the efficiency of the hot dip tank, the Aeroil Burner Co., Inc., West New York, N. J., has issued a new bulletin on a complete range of new models in hot wax dipping equipment.

Write to the manufacturer for free copies of this bulletin No. 268, containing specifications of fixed installations and portable units which the manufacturer claims will provide safer, swifter hot wax heating without discoloration, or rejects.

Alkyd Resin in New Calking Compound

Alkyd resins figure prominently in U. S. Patent 2325726, granted to H. L. Acker for making calking compositions suitable for sealing joints of airplanes, fuel tanks and the like. According to this invention, a permanently plastic, non-shrinking, non-hygroscopic calking composition is made with an alkyd resin, inert fillers and zinc chromate. For this purpose an unmodified glycerine-sebacic acid alkyd resin is employed. An inert filler, formed mainly from asbestos fiber or ground mica, is used in conjunction with the alkyd in a proportion ranging from ½ to 1¼ times the quantity of the resin. These are then all homogeneously mixed with from 0.83% to 1.64% of zinc chromate to form the finished calking compositions. —GLYCERINE FACTS.

Spraying Systems Nozzles

Designed as an engineering guide to the selection of exactly the right spray nozzle for any purpose, a new 32-page catalog is now available to users of spray nozzles and related equipment. This new catalog details spray characteristics, dimensions and performance data on an exceptionally complete line of standard spray nozzles. Also described are special purpose nozzles, made of a variety of materials, as well as accessories such as strainers and adjustable joints.

Nozzles are fully illustrated to show construction and kind of spray pattern produced. Written specifications on each nozzle are supplemented by tables showing capacities in gallons per minute and spray angles at various pressures for all the types and sizes available.

Several tables of useful engineering data complete the book. A copy of Catalog No. 22 may be obtained by writing Spraying Systems Company, 4017 W. Lake St., Chicago 24, Ill.

Metal Cleaning, Degreasing Information Free

Concurrently held in New York, Chicago and Los Angeles were the Oakite Third War Production Conferences on cleaning, de-scaling, derusting, degreasing and related production and maintenance operations. Participating with the entire Field Technical Service Representatives were the staffs of the Mechanical Engineering, Chemical and Research Laboratories and General Headquarters of Oakite Products, Inc., New York, N. Y.

These 2-day sessions were devoted to the collating of field experience in order to determine the best and most practical methods for stepping up wartime production through speedier cleaning, due consideration being given to the emergencies of manpower and the shortage of time. Also discussed were concrete, workable techniques for prolonging equipment life; improving plant sanitation and maintenance; faster, more thorough cleaning in repair and overhaul procedures.

Of particular interest to metal-working plants were the many new developments in Oakite materials, either now available or shortly to be released. The data exchanged by the Technical Service Representatives revealed successful methods for improving adhesion of organic finishes to ferrous metals; prevention of rust between production operations. Preparation of aluminum for spot welding, anodizing, Alroking, painting and other surface finishing operations; stripping identification paint from aluminum and aluminum alloys. Preparation of basis metals for electroplating. Study of coolants and lubricants in machining operations.

Data and information resulting from the discussions held at the various meetings are freely available to all through the medium of the Oakite Technical Field Service.

Cleaning Castings

THE CLEANING of castings before painting is a problem that varies greatly, depending on the size of the castings, their volume as to lot sizes, and other factors. One interesting sandblasting [or blast cleaning] layout has been developed which receives malleable castings from annealing furnaces, takes them to a shakeout which removes the worst of the sand and dirt, thence to two blasting machines, each of which will take a load averaging 1700-lbs. and clean it in about five minutes. No. 25 steel shot is used for producing a surface that can be galvanized.

The castings are mixed as to different types, and are carried up to an overhead storage bin or hopper. Later, clean castings are released from this hopper onto a circular sorting conveyor. Men stand around this circular conveyor and sort the castings, tossing each type into a barrel or other container provided for it, the barrels being arranged around the conveyor in circular formation.—A. B.

Large Scale Dipping With Equipment

IF YOU have anything to do with cleaning tanks, pickling, plating or straight dipping tanks for the application of various coatings, you know that considerable work is involved in letting the work down into the tanks, removing it and taking it away. In this connection, it is interesting to know that in some places where various kinds of cleaning, rinsing or finishing tanks are arranged in series, the same handling equipment can be used to serve them all.

In many of the large aircraft plants, for example, several long tanks are arranged side by side. They contain what is needed for such operations as metal cleaning, rinsing, surface treating (for example chromic acid dip), rinsing, drying, etc. An overhead traveling crossbeam with one or more electric hoists with cables, is often used to move baskets, trays or racks of material to and from these tanks. The operator, standing on the floor, can lower the charge into a tank, let it remain a few seconds or minutes, lift it out, move it to the next tank and repeat the procedure. In fact, it is so easy that a girl can and often does operate this equipment.

Some of the equipment, instead of having traveling electric hoists, is fitted with pneumatic or hydraulic cylinders for lowering and lifting the load of metal parts to be treated.

The use of this equipment not only saves much labor and time but it enables the operator to closely control the timing of immersion into the various tanks and the interval of time between withdrawal of material from one tank and immersion into the next one. It also assures accuracy in the correct sequence of these important operations on metal parts.—W. S.

Chain Belts for Your Conveyor Drives

The Chain Belt Co., 1600 W. Bruce St., Milwaukee 4, Wisc., has just issued a new catalog descriptive of Rex Z-Metal chain belts for better and more economical drive and conveyor service in many industries. Z-Metal chain belts are made in many styles, types and sizes for every kind of drive and conveyor service.

Industrial FINISHING

Distributed monthly to finishing room and paint shop foremen, production superintendents and company officials of metal-working, woodworking and miscellaneous industrial plants where production cleaning and finishing are major operations in parts and products manufacture.

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Editorial

Modernizing Your Finishing Procedure

The most modern streamlined economical product-painting setups today are 100% conveyorized. Perhaps every product painting job doesn't lend itself perfectly to complete conveyorization, but on volume production jobs it is probably safe to say that nine out of ten (perhaps 95%) could be or should be either partially or completely conveyorized.

On the ideal set-ups for metal products you see surface preparation (metal cleaning), paint application (spraying, dipping, roller coating, etc.) and paint drying (air drying or oven drying) all conveyorized—sometimes by a single conveyor. The operations may be mechanically performed so that the only manual labor involved is to load the conveyor at one station and unload it at another station.

Naturally, from this ideal setup, there can be numerous variations to suit the nature of the work (present and future), the space available and any other important factors that may enter the picture. The services of engineers can be obtained to design, lay out and install the entire system so it will operate as so many units of a coordinated machine.

Facilities available for performing operations along a conveyor line—doing them manually, semi-automatically or automatically—are practically unlimited. Conveyors of different designs and types can be obtained to suit the size, shape and other characteristics of products being made now and those likely to be made in the future.

Moving the work from one operation to another by conveyor offers many advantages, as compared to manual handling and the attendant trucking. It assures steady continuous movement of products to and from each operation, thereby establishing a definite rate of production; it prevents any damage of freshly painted products by their being accidentally dropped on the floor or knocked together; it insures a definite uniform time period for any air-conditions of

HILO NC BLACK CRYSTAL

NOW READY! NO PRIORITY!

All the virtues which made our No. 916 Black Crystal* famous are now available in this new remarkable Hilo finish.

- It's JUST AS TOUGH
- It's JUST AS BLACK
- It's JUST AS ATTRACTIVE IN DESIGN
- It's JUST AS SPARKLING
- It's SLIGHTLY SMOOTHER

Use it as you will—apply it . . . crystallize it . . . bake it! Hilo NC Black Crystal goes on perfectly on all kinds of wood and metal surfaces . . . cameras, radios, signalling instruments, field equipment, sound devices.

Write for New Bulletin No. 8-1 and Free Sample

*The old No. 916 Black Crystal is again available on priority.

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FACTORY - RAHWAY, N.J.

the work between operations; and it saves time, space and labor, all of which are costly.

Postwar Finishing Speed, Simplicity, Economy

★ We can call to mind a number of reasons why postwar furniture finishing will be far different in methods and types of materials used, as compared to our present finishing.

Labor cost will be the big factor. We will have to speed up our postwar production because labor costs, while they will not be as high as our present sub-standard war costs, will be higher than pre-war costs because wages will perhaps never be as low as they were before the war. And, of course, one way to reduce the unit cost of finish is to speed up our production.

This war has taught all of us lessons in production that we will never forget, and I am sure that our country and all of its allied industries will never want to go back to our old pre-war production levels.

In order to accelerate production, many manufacturers who at present do not have conveyorized finishing departments will be compelled to install them in order to be able to compete successfully with other manufacturers.

Finishing will be more simple.

★ Guest Editorial . . . Many readers can write an excellent editorial—two or three paragraphs that present a timely suggestion or valuable idea which will stimulate real thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.

Sound the Alert!

MANAGEMENT • LABOR

—for the 5th War Loan drive during June and July. The need for the 5th War Loan is immediate, crucial. For impending events may make the 5th the supreme financial effort of the war.

The U. S. Treasury has set the overall goal at $16,000,000,000—$6,000,000,000 from individuals alone. This is the biggest sum ever asked of the people—*and it must be raised.*

That's why the U. S. Treasury asks Management and Labor to sit down together and organize—NOW!

In planning your quota campaign, work in close cooperation with the Chairman of your War Finance Committee. Everything is set to make the 5th War Loan drive a huge success—with your help!

Here's the Quota Plan:

1. Plant quotas are to be established on the basis of an *average* $100 *cash* (not maturity value) purchase per employee.
2. Regular Payroll Savings deductions made during the drive accounting period will be credited toward the plant quota.
3. 90% of the employees are expected to contribute toward raising the cash quota by buying extra 5th War Loan Bonds: 1—Outright by cash. 2—By extra installment deductions. 3—By extra installment deductions plus cash.

Example: JOHN DOE Mfg. Co.—1,000 Employees

1,000 employees x $100 - $100,000 Cash Quota

Regular Payroll deductions during the eight weekly payroll Accounting Periods of June and July. 30,000

$70,000 (to be raised by sales of extra Bonds to at least 900 employees)

ORGANIZE • SOLICIT • DELIVER

5TH WAR LOAN

The Treasury Department acknowledges with appreciation the publication of this message by

INDUSTRIAL FINISHING

This is an official U. S. Treasury advertisement—prepared under the auspices of Treasury Department and War Advertising Council.

Because of the development of materials that will enable us to use fewer coats and at the same time produce better finishes, our postwar finishing will be more simple.

We will probably have a combination stain-filler-sealer that can be applied at one operation instead of our present stain, washcoat, sand, fill, sealer operations.

I know of one manufacturer who is manufacturing and selling a lacquer glaze stain that has the special pigments incorporated in lacquer. This material can be sprayed on and finished over, and it is very hard to distinguish from a hard glazed job. This eliminates the operation of hand glazing.

These are just a few examples of the simplicity of postwar finishes. Postwar finishes will be more economical. Raw materials, because of the higher labor costs involved in producing them and because of their better qualities, will perhaps be higher in price than prewar materials. But because we will use fewer coats and our postwar materials will be better than at present, assuring more durability, our finishing will be more economical.

And, of course, there is always competition which will certainly be keener after the war. In some cases this will cause the furniture manufacturer to sell his goods for a small margin of profit; and this, in turn, will make it necessary for him to go in for as economical finishing as possible.—H. W. CHESTER.

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Random Comment on the Industrial Scene

BY LAWRENCE H. SINGER.

To Postwar China—This observer recently had an opportunity to enjoy a long private talk with the Most Rev. Paul Yu-pin, native-born Roman Catholic bishop of Nanking, China, who has been making an extensive tour of the U.S. The bishop has conferred with President Roosevelt, the Senate Foreign Relations Committee, and other high officials here on his country's probable needs in the great reconstruction task that lies ahead.

Monsignor Yu-pin told the writer that China will require the services of tens of thousands of American technicians — engineers, chemists, architects and others. "But tell your people they must come with the thought of helping, not dominating," he added gently.

* * *

Uproar in Wood—Manufacturers are still slightly agog after contemplating the possibilities opened up by du Pont's announcement of its "transmuted" wood process. As all industry already knows, the technique involves impregnating wood with a water solution of methylolurea.

The "transmution" turns soft poplar into a product as tough as hard maples; the latter, in turn, can be changed into a material equalling ebony in hardness. In addition, the wood will not warp, is non-inflammable, and becomes highly resistant to acid. Moisture has little effect in raising the grain.

In the furniture field, some interesting reflections can be considered. It will be possible to ship products to any corner of the world, with no fear of warping or

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All the home front folks gladly and thankfully pay them tribute for their great achievements.

Our men and women on the production front who produced the Lightnings and Thunderbolts are happy to read about the fruits of their labors.

Listed here are a few of the war products now being coated with our materials. Phone, wire or write and let one of our finishing experts help you "keep production rolling."

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swelling. Color can be made an integral part of the wood, and scratches will be removable by light rubbing.

* * *

Food Cans Painted—The Quartermaster Corps has finally admitted the wisdom of coating the outside surfaces of army food cans with a protective film of olive drab paint. In addition to the factor of rust prevention, one of the war's lessons has pointed up to the fact that piles of bright empty cans strewn over a combat area are an inviting guide to enemy bombers.

Forty million cases of canned goods were ordered coated in a recent ruling of the Army Service Forces. After trying out several alternate procedures, the dip-coating method was determined to be the most satisfactory and economical technique.

* * *

Postwar Russia Buying — The enormous purchases of American industrial goods by Soviet Russia in the early postwar period may go a long way towards alleviating the production drop feared by many of our foremost economists. The U.S.S.R. purchasing mission, which has been visiting this country, is reputed to be lining up contracts that may total ten billion dollars. At least thirty large American firms are understood to be participating in the current negotiations. One domestic corporation alone has signified its willingness to finance 250 million dollars worth of orders.

The obvious advantage of the economic tie-up with Moscow is apparent from an examination of the latter's requirements; she will be needing the very products which will be glutting our postwar markets — machine tools, chemicals, electrical apparatus and heavy machinery, for example. Russia, in turn, will be able to ship us many of the raw materials we shall sorely need — manganese, tungsten, chrome, mercury and molybdenum.

* * *

After Cutbacks—What? — Aside from metalworking plants, industrial changeover to civilian production should be simple in a vast majority of factories. This is the gist of a survey made by the Office of Civilian Requirements, in which 6000 firms were queried.

Three to six months will be required for reconversion by about one-third of the factories covered. About the same number believe they will be ready for full civilian production in less than 90 days. The balance contend that they will be set almost immediately to turn out peacetime products. This report is a heartening document in the face of doleful forecasts.

* * *

Preparing for Peace—What happens to a manufacturer of bomb sights when the last shot has been fired? Offhand, you might expect a prophecy of utter collapse. But Carl L. Norden Inc., famous specialists in that field, are bravely planning for peacetime conversion.

The firm recently organized Norden Laboratories Corp. in New York to chart the way to postwar developments. Plans already considered include the design of numerous instruments for commercial aviation, and the manufacture of machines for other industrial uses. Ever since 1917, when the Norden company was organized, its only customer has been the U.S. government.

* * *

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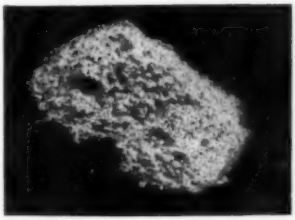

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market for half a million washing machines in the first year of peace, President J. S. Sayre has confidently predicted. This would represent four times the company's best prewar volume.

Despite talk of cutting distribution costs, he expects that Bendix will continue its former distributor-dealer outlets. "We don't believe much can be done at this time in making such operations more effective," Sayre contends.

* * *

Real Experts Wanted—The postwar world will create many new fields for specialists, and color engineering should prove to be one increasingly important sphere of activity. Selecting decorative schemes for trains, ships and planes will not be a function of esthetic dreamers; trained technicians will be called upon to plan the proper combination of tints.

Recent studies have shown, as an illustration, that browns and yellows induce nausea at sea and in the air, whereas soft greens and blues are restful. One important airline has adopted green sheets as a step towards cutting down air sickness.

* * *

Fireproof Fabric—Firestone Rubber Co. has introduced a new upholstery fabric, named Velon, which should have important peacetime applications. It is fireproof, and resistant to water, oil and grease. Even ink spots are speedily removed. Velon promises to be a sturdy material for heavy-duty furniture, and for railroad and bus seats, when it is eventually available for civilian use.

* * *

About Small Industries—Saving hundreds of small manufacturing plants in the first wild scramble for peacetime orders will assume the proportions of a major problem to industry. That is the warning sounded by *Electrical World* in a recent thoughtful survey.

"The large manufacturers have sales forces and sales plans, and during the war they have continued to maintain a certain amount of contact with their old customers," continues this publication. "The smaller outfits have, in many cases, lost these contacts, and because they have been too busy with war work to think of the future, have no plans." If severe dislocations are to be prevented, the manufacturer of modest resources will be wise if he starts giving serious study to this reconversion challenge.

* * *

Jobs for All?—Is full employment to be our major industrial goal when peace comes? This question was explored in a penetrating article written a few weeks ago for the *New York Times Magazine* by E. J. Phelan, acting director of the International Labor Office.

The Nazi Labor Front boasted of almost 100% employment before the war, we are reminded, but it resulted only in guns and slaughter. "We would come closer to the mark," Phelan asserts, "if we should set out postwar sights of 'Jobs Producing Goods and Services for All.' This is a much closer approximation of the social objectives for which the United Nations are at war."

* * *

Wartime Deterioration—A warning about the complacency of both manufacturers and dealers concerning the decline in the quality

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of current furniture products was sounded not long ago by Charles Shaughnessy, of R. H. Macy & Co.

Addressing the National Retail Furniture Association, he called for a return of the traditions and heritages that formerly played a dominant part in the industry's thinking. "There is a great danger," Shaughnessy continued, "that we may lower the level of our standards, and that we may not strive soon enough or hard enough to throw off this evil."

* * *

Big Cutbacks Ahead—Germany's fall will result in an over-all cut of more than one-third in our war production, we have been told by Charles E. Wilson, executive vice-president of the War Production Board. This anticipated cutback can be translated into *25 billion dollars* worth of contract cancellations. Part of this slack may be taken up by resumption of auto production on a limited scale. As these lines are written, the W. P. B. has just hinted that plans for partial reconversion may be ready by late July.

* * *

For N. Y. Visitors—Free tickets to leading broadcasts are available for readers of INDUSTRIAL FINISHING planning a visit to New York. Drop a line ahead to: Lawrence H. Singer, 130 W. 86 St., New York 24, N.Y. Cooperating sponsors include: P. Ballantine and Sons, Schenley Distillers, and Prince Matchabelli.

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We are informed by Arthur Kiernan, president, that Berry Brothers, Inc., Detroit, producers of aviation finishes, has been awarded a star for its "E" Award Flag, in recognition of continued outstanding performance in the production of war materials. Notification of this new honor was received in a letter from Under Secretary of War, Robert P. Patterson.

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